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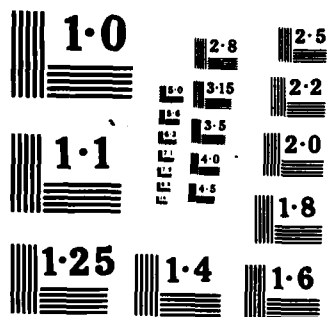
NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS  
LOCUSTVILLE POND DAM 1... (U) CORPS OF ENGINEERS WALTHAM  
MA NEW ENGLAND DIV JAN 81

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MASS / RI COASTAL BASIN  
HOPKINTON, RHODE ISLAND

LOCUSTVILLE POND DAM  
RI 01408

PHASE I INSPECTION REPORT  
NATIONAL DAM INSPECTION PROGRAM



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JUL 17 1985  
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DEPARTMENT OF THE ARMY  
NEW ENGLAND DIVISION, CORPS OF ENGINEERS  
WALTHAM, MASS.

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JANUARY, 1981

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8. PERFORMING ORGANIZATION NAME AND ADDRESS		9. CONTRACT OR GRANT NUMBER(s)
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19. KEY WORDS (Continue on reverse side if necessary and identify by block number) DAMS, INSPECTION, DAM SAFETY,  Mass/RI Coastal Basin Hopkinton, Rhode Island Brushy Brook		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)  —The dam is an earthfill Dam with vertical upstream and downstream faces composed of ungrouted stone walls. The dam is 18 ft. high and 320 ft. long. It is small in size with a high hazard potential. The test flood for the dam is the full PMF. The dam is considered to be in poor condition. There are various remedial measures which must be implemented by the owner.		



DEPARTMENT OF THE ARMY  
NEW ENGLAND DIVISION, CORPS OF ENGINEERS  
424 TRAPelo ROAD  
WALTHAM, MASSACHUSETTS 02154

NEDED

Honorable J. Joseph Garrahy  
Governor of the State of Rhode Island  
State House  
Providence, Rhode Island 02903

Dear Governor Garrahy:

Inclosed is a copy of the Locustville Pond Dam (RI-01408) Phase I Inspection Report, prepared under the National Program for Inspection of Non-Federal Dams. This report is based upon a visual inspection, a review of past performance, and a preliminary hydrological analysis.

The preliminary hydrologic analysis indicates that the spillway capacity for the Locustville Pond Dam would likely be exceeded by floods greater than 11-1/2 percent of the Probable Maximum Flood (PMF). Our screening criteria specifies that a dam classified as high hazard with a spillway capacity insufficient to discharge fifty percent of the PMF be judged as having a seriously inadequate spillway. As a result this dam is assessed as unsafe, non-emergency until more detailed studies prove otherwise or corrective measures are completed.

The term "unsafe" applied to a dam because of an inadequate spillway does not indicate the same degree of emergency as it would if applied because of structural deficiency. It does indicate, however, that a severe storm may cause overtopping and possible failure of the dam, with significant damage and potential loss of life downstream.

We recommend that within twelve months from the date of this report the owner of the dam engage the services of a qualified registered engineer to determine further the potential of overtopping the dam and the need for and the means to increase project discharge capacity. Based on this determination, appropriate remedial mitigating measures should be designed and completed within 24 months of this date of notification. In the interim a detailed emergency operation plan and warning system should be promptly developed and round-the-clock surveillance be provided during periods of heavy precipitation or high project discharge.

009 07 1981

NEDED

Honorable J. Joseph Garrahy

I approve the report and support the findings and recommendations described in Section 7, with qualifications as noted above. I request that you keep me informed of the actions taken to implement these recommendations since this follow-up is an important part of the program.

Copies of this report have been forwarded to the Department of Environmental Management and to the owner, Auralux Corp., Hope Valley, RI. Copies will be available to the public in thirty days.

I wish to thank you and the Department of Environmental Managment for your cooperation in this program.

Sincerely,



C. E. EDGAR, III  
Colonel, Corps of Engineers  
Commander and Division Engineer

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LOCUSTVILLE POND DAM

RI 01408

MA/RI COASTAL BASIN

HOPKINTON, RHODE ISLAND

PHASE 1 INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM



# NATIONAL DAM INSPECTION REPORT

## PHASE 1 INSPECTION REPORT

IDENTIFICATION NO: RI 01408  
NAME OF DAM: Locustville Pond Dam  
COUNTY AND STATE: Washington County,  
Rhode Island  
STREAM: Brushy Brook  
DATE OF INSPECTION: 25 November 1980

### Brief Assessment

Locustville Pond Dam is an earthfill dam with vertical upstream and downstream faces composed of ungrouted stone walls. The dam is 18 feet high, has a crest width of 20 feet, and a length (including spillways) of 320 feet. There are two spillways; one located near the left abutment and one near the right abutment. The main spillway is at the right abutment and is 64 feet long. A secondary spillway is located 35 feet to the right of the left abutment and is 33.8 feet long. A headrace is located at the left abutment which formerly directed flow to an adjacent mill complex. The inlet to the headrace consists of a 5 foot high by 2.5 foot wide opening controlled by a wood sluice gate. Presently the downstream end of the headrace is plugged with fill and a concrete wall and flow is directed through a rectangular outlet and over a side discharge spillway. The dam and reservoir are presently used for recreation.

The dam is classified as SMALL in size and a HIGH hazard structure in accordance with recommended guidelines established by the Corps of Engineers. Based on size and hazard classification, the adopted test flood for this structure is equal to the full Probable Maximum Flood (PMF) which is estimated to be 1,200 CSM, or 13,560 CFS, from the 11.3 square mile drainage basin. This test flood has a routed outflow discharge equal to 12,715 CFS and would overtop the main embankment by 4.7 feet. The maximum spillway capacity is equal to 1,500 CFS which represents only 11.5% of the test flood outflow, therefore, the spillway capacity is considered inadequate.

Based on a visual inspection at the site, the dam is considered to be in POOR condition. It is recommended that the owner engage the services of a registered engineer experienced in the design of dams to accomplish the following:

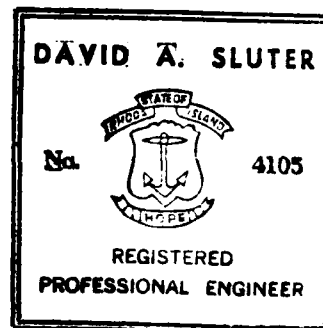
1. Perform detailed hydrologic and hydraulic studies to assess further the potential of overtopping the dam and the need for and means to increase the project discharge capacity.
2. Inspect and evaluate the right spillway when no water is flowing over it.
3. Investigate and evaluate the cause of depressions and settlement observed in the earthfill on the dam crest.
4. Evaluate and determine the cause of irregularity of the downstream face between the spillways and the potential deleterious effects of seepage from the toe of the dam in same zone where the face is irregular.
5. Investigate and recommend methods to repair cracks in the left spillway crest which allow seepage into the earth fill behind the downstream face of the spillway.
6. Investigate and evaluate seepage through the downstream faces of the left and right spillways.
7. Recommend a program to remove the growth of brush and trees on the crest, downstream face and downstream toe of the dam and on the right channel wall and toe of the headrace.
8. Provide a low level outlet by which the pond can be drained for repairs and emergencies.

These and other recommendations and remedial measures as described in Section 7 should be implemented by the owner within one year after receipt of this Phase 1 Inspection Report.

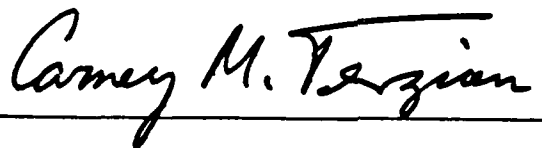
NEW ENGLAND ENGINEERING, INC.

BY:


David A. Sluter  
David A. Sluter, P. E.  
President




his Phase I Inspection Report on Locustville Pond Dam (RI-01408) has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgement and practice, and is hereby submitted for approval.



CARNEY M. TERZIAN, MEMBER  
Design Branch  
Engineering Division

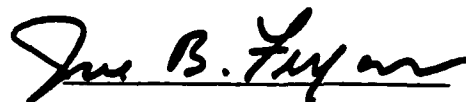


JOSEPH W. FINEGAN, JR., MEMBER  
Water Control Branch  
Engineering Division



ARAMAST MAHTESIAN, CHAIRMAN  
Geotechnical Engineering Branch  
Engineering Division

APPROVAL RECOMMENDED:



JOE B. FRYAR  
Chief, Engineering Division

## PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase 1 Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, DC 20314. The purpose of a Phase 1 Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase 1 investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with the data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase 1 inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test Flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonable possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition, and the downstream damage potential.

The Phase 1 Investigation does not include an assessment of the need for fences, gates, no-trespassing signs, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety to the public. An evaluation of the project for compliance with OSHA rules and regulations is also excluded.

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3. Headrace. The intake to the headrace at the left abutment of the dam consists of a concrete gate structure with a 1½ inch thick, 2.5 x 5 foot wooden gate operated by a rack and pinion control mechanism in fair to good condition (Photo C-9). The gate was open at the time of inspection and the owner reports the gate mechanism to be operable. The upstream training walls of the intake channel are of stone masonry construction faced with concrete which is severely eroded at and slightly above the water level (Photo C-3). The concrete surface of the gate structure is in fair condition with some minor spalling and some 1/8 inch wide cracks. The walls of the headrace channel are stone masonry with a concrete lining (Photo C-10). The stone masonry portion of the right wall has been partially repointed but mortar is missing at many locations in the wall. Dense growth of brush or vines at the toe of the right wall of the channel obscures much of the downstream face and toe from close inspection (Photo C-10, C-11). However, seepage was observed to emerge downslope from the toe of the right wall of the headrace in an area extending from the intake gate to 30 feet downstream from the gate. This seepage was clear and flowed at an estimated rate of 20-40 gpm (Photo C-11). The outlet spillway at the downstream end of the headrace is in poor condition. The outlet consists of a 3.5 foot high x 5 foot wide opening with wooden stop logs to control the pond level and a concrete overflow weir (Photo C-12). The wooden stop log slot on the right side of the spillway is rotted and in poor condition, and the stop log slot on the left side of the spillway is missing. The pressure of water impounded in the channel apparently holds the stop logs in place. The concrete surface of the overflow weir is eroded, exposing the concrete aggregate, and flashboards are no longer usable on the weir (Photo C-12). The headrace delivered water to the mill complex downstream at one time but the end is now sealed off with a concrete wall and earth fill (Photo C-12).

d. Downstream Channel. The downstream channel for the left spillway consists of a natural stream bed and is forested on both sides (Photo C-14). The discharge channel for the right spillway is also a natural stream bed with bedrock at the toe of the spillway and cobbles and boulders downstream (Photo C-4). The discharge channel is forested on both sides and contains miscellaneous debris. The left and right spillway discharge channels are separated by a small island containing a chemical waste disposal pond, shown in Photos C-2 and

Several trees up to 4 inch diameter grow between stones in the downstream face of the dam and it appears that these trees are responsible for dislodging some of the stones in the face of the dam. Many trees up to 14 inch diameter also grow at the toe of the downstream face (Photo C-2).

Ponded water was observed at the toe of the wall at Station 1+55 (Photo C-7). Rust-colored staining was observed at the bottom of the ponded water, and outflow from the ponded water flowed clear at an estimated rate of 2 gpm.

c. Appurtenant Structures

1. Left Spillway. The left spillway is in generally poor condition. Cracks in the concrete cap of the spillway weir were observed to permit seepage into the earthfill behind the downstream ungrouted stone masonry face (Photo C-1). The rods shown sticking up through the spillway crest were formerly used to support flashboards. They now may collect debris and should be removed. Seepage was observed to emerge through the downstream face of the spillway between Station 0+50 and the right abutment of the spillway from the toe of the downstream face to within 5 feet of the spillway weir. The largest seep in the zone was observed at Station 0+54, approximately 5 feet below the spillway crest and flowing clear at a rate of about 5 gpm. Seepage at the toe of the downstream face at the contact with the left abutment also was observed to flow clear at an approximate rate of 5 gpm. The facing of both training walls is in poor condition and is cracked and severely eroded at the water level (Photos C-1, C-13). Brush, small trees and stumps to 4 inches in diameter are present in the open joints of the stone masonry on the downstream face to the spillway.
2. Right Spillway. The right spillway is in fair condition. No misalignment or cracking of the concrete weir or stone masonry downstream face was observable (Photos C-4, C-6). Clear seepage was observed to emerge from the right half of the downstream face of the spillway from the toe to approximately 2 feet below the crest at a total rate of about 1 to 2 gpm (Photo C-5). Seepage through the left half of the spillway could not be observed because of water overflowing that portion of the spillway (Photo C-4). The concrete facing on the left training wall has been eroded at the water line and is badly spalled and cracked (Photo C-6).



## SECTION 3

### VISUAL INSPECTION

#### 3.1 Findings

- a. General. The Phase 1 visual inspection of the Locustville Pond Dam was conducted on November 25, 1980 by representatives of New England Engineering, Inc. and Geotechnical Engineers, Inc. A visual checklist and photographic record of that inspection have been included in Appendix A and C, respectively, of this report. At the time of the inspection the water level was just over the crest of the right spillway.

Based on the visual inspection, the dam at Locustville Pond is judged to be in POOR condition.

- b. Dam. The dam is an earthfill embankment with vertical upstream and downstream faces composed of ungrouted stone walls and is 320 feet in length with a maximum height of 18 feet. Spillways are located near the left and right abutments and an outlet is located at the left abutment.
  1. Crest. The crest of the dam is approximately 20 feet in width between the left and right spillways and is covered with brush and trees up to 6 inches in diameter (Photo C-1, C-6). The earthfill surface of the crest is irregular and has experienced settlement relative to the upstream face of approximately 1 foot at Station 0+67 and from Station 1+58 to 1+70. Depressions in the earthfill 6-8 inches deep behind the upstream face were observed at Station 0+14, 0+27, 0+67, 0+71, 1+58 and 1+95, and a depression at least 3 feet deep was observed at Station 2+07 (Photo C-13). However, no movement or misalignment of the upstream face above the water level was observable at the locations of these depressions.
  2. Upstream Face. The upstream face of the dam is of stone masonry construction with a concrete face visible above the water level. The water level was at the right spillway crest at the time of inspection. The concrete face is severely eroded at the water level, as shown in Photo C-1. The stone masonry portion of the upstream face was submerged and not observable.
  3. Downstream Face and Toe. The downstream face of the dam is very irregular, varying from a vertical orientation to a slight slope in the downstream direction, as shown in Photo C-8. Many dislodged stones and voids were observed in the wall between Stations 1+50 and 2+00 (Photo C-8).

SECTION 2  
ENGINEERING DATA

2.1 Design

There is no design information available for the original construction of this dam.

2.2 Construction

No records of the original dam construction were found. Repair efforts since 1939 are recorded in the correspondence and inspection reports included in Appendix B of this report.

2.3 Operation

No operation records are maintained.

2.4 Evaluation

- a. Availability. No original design or construction information is available.
- b. Adequacy. The lack of in-depth engineering design data did not allow for a definitive review. Therefore, the adequacy of this dam could not be assessed from the point of reviewing design and construction data, but is based primarily on visual inspection, past performance and sound engineering judgement.
- c. Validity. No engineering data is available.

- |     |  |   |
|-----|--|---|
| 3.  | Height                                 | 18 feet maximum   |
| 4.  | Top width                              | 20 feet   |
| 5.  | Side slopes                            | Vertical  |
| 6.  | Zoning                                 | Unknown   |
| 7.  | Impervious Core                        | Unknown   |
| 8.  | Cutoff                                 | Unknown   |
| 9.  | Grout Curtain                          | Unknown   |
| 10. | Other                                  | ---   |
| h.  | <u>Diversion and Regulating Tunnel</u> | N/A   |
| i.  | <u>Spillway</u>                        |   |
| 1.  | Type                                   | Free overflow, broad crested, vertical fall weir.             |
| 2.  | Length of weir                         |   |
|     | a. Right                               | 64.0 feet   |
|     | b. Left                                | 33.8 feet   |
| 3.  | Crest elevation                        |   |
|     | a. Right                               | 95.0 feet   |
|     | b. Left                                | 95.4 feet   |
| 4.  | Gates                                  | None  |
| 5.  | U/S Channel                            | Natural bed of reservoir                                      |
| 6.  | D/S Channel                            | Natural bed of Brushy Brook                                   |
| 7.  | General                                | D/S Channel passes under a roadway bridge 350 feet downstream |
| j.  | <u>Regulating Outlets</u>              |   |
| 1.  | Invert                                 | 90.1 feet   |
| 2.  | Size                                   | 5 foot high by 2.5 foot wide rectangular opening              |
| 3.  | Description                            | Concrete intake structure                                     |
| 4.  | Control Mechanism                      | Rack and pinion vertical lift sluice gate, manually operated. |
| 5.  | Other                                  |   |

- |    |                                       |  |
|----|---------------------------------------|--|
| 4. | Normal pool                           | 95.0   |
| 5. | Full flood control pool               | N/A  |
| 6. | Spillway crest                        |  |
|    | a. Right (Principal)                  | 95.0   |
|    | b. Left                               | 95.4   |
| 7. | Design surcharge<br>(Original Design) | Unknown                                      |
| 8. | Top of dam                            | 98.1   |
| 9. | Test flood                            | 102.9  |
| d. | <u>Reservoir Lengths (in feet)</u>    |  |
| 1. | Normal pool                           | 6,500  |
| 2. | Flood control pool                    | N/A  |
| 3. | Spillway crest pool                   | 6,500  |
| 4. | Top of dam                            | 6,500  |
| 5. | Test flood pool                       | 6,500  |
| e. | <u>Storage (acre-feet)</u>            |  |
| 1. | Normal pool                           | 630  |
| 2. | Flood control pool                    | N/A  |
| 3. | Spillway crest pool                   | 630  |
| 4. | Top of dam                            | 910  |
| 5. | Test flood pool                       | 1,342  |
| f. | <u>Reservoir Surface Area (Areas)</u> |  |
| 1. | Normal pool                           | 90   |
| 2. | Flood control pool                    | N/A  |
| 3. | Spillway crest                        | 90   |
| 4. | Test flood pool                       | 90   |
| 5. | Top of dam                            | 90   |
| g. | <u>Dam</u>                            |  |
| 1. | Type                                  | Earth embankment                             |
| 2. | Length                                | 320 feet including 97.8 feet<br>of spillway. |

1. Outlet Works

Conduit Size	5 foot high by 2.5 foot wide rectangular outlet. Invert elevation 90.1 feet.
a. Discharge Capacity	95 CFS at spillway crest elevation 95.0 feet.
b. Discharge Capacity	140 CFS at top of dam. Elevation 98.1 feet.
c. Discharge Capacity	185 CFS at the test flood. Elevation 102.9 feet.
2. Maximum known flood at damsite. Unknown
3.
  - a. Ungated spillway capacity (right) at top of dam. 1,050 CFS
  - b. Ungated spillway capacity (left) at top of dam. 450 CFS
4. Ungated spillway capacity (total) at test flood elevation 6,450 CFS
5. Gated spillway capacity at normal pool elevation N/A
6. Gated spillway capacity at test flood elevation N/A
7. Total spillway capacity at test flood elevation 6,450 CFS
8. Total project discharge at top of dam. 1,640 CFS
9. Total project discharge at test flood elevation 12,715 CFS
- c. Elevations (Feet above NGVD)
  1. Streambed at toe of dam 80.1
  2. Bottom of cutoff Unknown
  3. Maximum tailwater Unknown

- f. Operator. The dam and gate are maintained and operated by the Auralux Corporation:

Mr. Kenneth E. Taylor  
Plant Manager  
Auralux Corporation  
Hope Valley, RI 02832  
(401)539-2306

- g. Purpose of Dam. The dam is presently used for recreation purposes and formerly supplied water for power and processing.
- h. Design and Construction History. There are no available records on the history of the dam prior to 1939. It is estimated that the dam was constructed in the late 1800's to provide water and power to the mill downstream. The original owner is unknown, however, it is reported that the Saybrooke Manufacturing Company operated the mill during the late 1920's and early 1930's when the mill was partially destroyed by fire. Renovation of the headrace intake structure was completed in January 1940 and minor repairs to the right training wall and downstream face of the left spillway were reported in May 1945. No record of the design or construction of these repairs other than inspection reports are available. Correspondence and inspection reports regarding these repairs are included in Appendix B.
- i. Normal Operating Procedures. There are no formal operational procedures for this dam, however, in accordance with the wishes of the Locustville Pond Association, Auralux, Inc. drops the level of the pond in the winter by removing two boards (approximately 24-30") from the stop log structure of the headrace outlet. The pond level is raised to the right spillway level again after the spring runoff.

### 1.3 Pertinent Data

- a. Drainage Area. Locustville Pond Dam is located in the Town of Hopkinton, Rhode Island. The drainage basin for the dam is located in Hopkinton and Exeter, Rhode Island and Voluntown, Connecticut and is generally triangular in shape with a maximum length of 5 miles and a total area of 11.3 square miles. (See Appendix D for Basin Map). Approximately 20% of the watershed is comprised of natural storage areas. The topography is generally rolling, except in the upper reaches with elevations ranging from 453 feet at Dye Hill to 95 feet at the spillway crest of the dam.
- b. Discharge at Damsite. There is no discharge data available for this dam. Listed below is discharge data for the spillway and outlet works.

- b. Description of the Dam and Appurtenances. Locustville Pond Dam is approximately 320 feet long, including the spillways, with an average height of 17 to 18 feet. The dam embankment is an earthfill section with vertical stone masonry faces and a crest width of approximately 20 feet. The right spillway is the principal spillway, is 64 feet in length, and is located at the right abutment. The secondary spillway is 34 feet in length and is located 35 feet to the right of the left abutment.

An outlet in the form of a headrace is located at the left abutment to the left of the spillway. Flow through a 5 foot high by 2.5 foot wide inlet to the headrace is controlled by a wood sluice gate with a rack and pinion lifting mechanism. The outlet from the headrace consists of 3.5 foot high by 5 foot wide opening with stop logs to control the water level and a 20 foot long side discharge overflow weir. Flow from both spillways and the headrace enters Brushy Brook downstream of the dam. Flows from the left and right spillways are divided by a small island at the toe of the dam.

- c. Size Classification. The dam at Locustville Pond has an impoundment capacity at the top of the dam (elevation 98.1 NGVD) equal to 910 Ac-Ft and a height of 18.0 feet. In accordance with guidelines established by the Corps of Engineers, this dam is classified as a SMALL size structure based on its impoundment capacity. Corps of Engineers guidelines specify that dams with impoundment capacities less than 1,000 AC-Ft and greater than or equal to 50 Ac-Ft be classified as SMALL in size.
- d. Hazard Classification. This dam is classified as a HIGH hazard potential because its failure could result in loss of more than a few lives and inundation of 10-12 residential, commercial and industrial structures. Flooding and potential damage could occur to those public utilities within the rights of way. Damage may also occur to the concrete bridge at Rhode Island Route 3, 350 feet downstream from the dam and the dam on the Wood River located approximately 1,700 feet downstream from Route 3. It is estimated that the dam failure discharge of 8,340 CFS will produce a water depth of 13-14 feet downstream to Route 3 and depths of 8-10 feet between Route 3 and the Wood River Dam. These are increases of 4-5 and 4-6 feet respectively over the depths produced by the prefailure discharge of 1,640 CFS. Dam failure and subsequent flooding with high water velocities will carry trees, brush and other debris downstream increasing the damage potential. Increased depth of flooding due to dam failure may cause or increase the depth of water in dwellings 4 to 6 feet.
- e. Ownership. The dam is presently owned by the Auralux Corporation, Hope Valley, Rhode Island.

# NATIONAL DAM INSPECTION PROGRAM

## PHASE 1 - INSPECTION PROGRAM

### LOCUSTVILLE POND DAM

#### SECTION 1

#### PROJECT INFORMATION

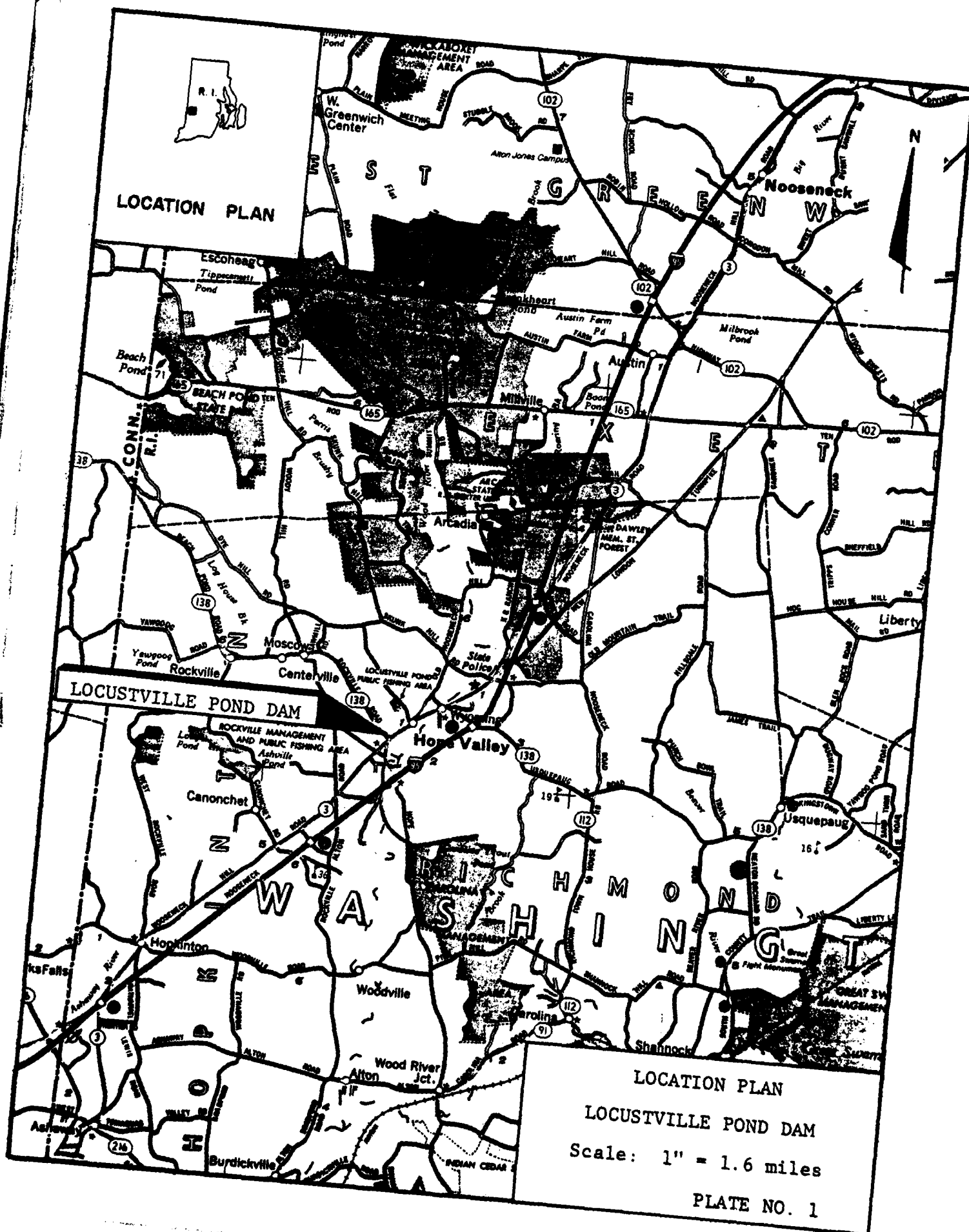
##### 1.1 General

- a. Authority. Public Law 92-367, August 8, 1972, authorized the Secretary of the Army through the Corps of Engineers to initiate a national program of dam inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. New England Engineering, Inc. has been retained by the New England Division to inspect and report on selected dams in the State of Rhode Island. Authorization and notice to proceed was issued to New England Engineering, Inc. under a letter from William E. Hodgson, Jr., Colonel, Corps of Engineers. Contract No. DACW33-81-C-0007 has been assigned by the Corps of Engineers for this work.
- b. Purpose of Inspection.
  1. Perform technical inspection and evaluation of non-Federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-Federal interests.
  2. Encourage and assist the State to initiate quickly effective dam safety programs for non-Federal dams.
  3. To update, verify, and complete the National Inventory of Dams.

##### 1.2 Description of the Project

- a. Location. Locustville Pond Dam is located on Brushy Brook in the Town of Hopkinton, Washington County, Rhode Island, approximately 400 feet north of the intersection of Rhode Island Routes 3 and 138. Coordinates of the dam are approximately 41 degrees, 30.5' North Latitude, and 71 degrees, 43.0' West Longitude as shown on the Hope Valley, RI USGS Quadrangle Sheet. The dam impounds water from the Brushy Brook which drains a 11.3 square mile watershed of rolling, wooded terrain. The axis of the pond is oriented in a Northeast-Southwest direction with the dam at the southern extremity of the pond.







OVERVIEW PHOTO - Locustville Pond Dam

December 31, 1980

## APPENDICES

APPENDIX A	INSPECTION CHECKLIST
APPENDIX B	ENGINEERING DATA
APPENDIX C	PHOTOGRAPHS
APPENDIX D	HYDROLOGIC & HYDRAULIC COMPUTATIONS
APPENDIX E	INFORMATION AS CONTAINED IN THE NATIONAL INVENTORY OF DAMS

<u>Section</u>	<u>Page</u>
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C-14. The channels merge into a single channel approximately 300 feet downstream from the dam. High discharges over the spillways during periods of heavy precipitation could result in the chemical waste pond being overtopped and chemicals being discharged directly into the stream.

### 3.2 Evaluation

Based on visual observations, the dam appears to be in POOR condition. The following features could adversely effect the future performance of the dam and should be investigated:

- a. Differential settlement of the crest at Station 0+67 and from Station 1+58 to 1+70 and the formation of numerous depressions on the crest behind the upstream face of the dam.
- b. Irregularity of the downstream face and its relationship to ponded water observed from Station 1+50 to 2+00.
- c. Continued growth of trees on the crest, downstream face and downstream toe of the dam which could affect the stability of the downstream face and provide paths of seepage through the earthfill along the root systems.
- d. Cracks in the weir of the left spillway which permit seepage into earthfill material behind the downstream face of the spillway.
- e. Seepage through the downstream face of the right spillway.
- f. Seepage from the right channel wall of the headrace.
- g. Deterioration of the stop logs and slots on the headrace spillway.
- h. Lack of a low level outlet to drain the pond for maintenance or in an emergency.
- i. The rods sticking through the crest of the left spillway should be removed.

## SECTION 4

### OPERATIONAL AND MAINTENANCE PROCEDURES

#### 4.1 Operational Procedures

- a. General. The pond level can be regulated by the use of the sluice gate at the headrace inlet or by the stop logs at the headrace outlet. The invert of the headrace outlet is at elevation 90.1 and can only draw the pond level down approximately 5 feet below the spillway level. The pond is drawn down 24-30 inches each fall and raised back to the spillway level in the spring, at the request of the Locustville Pond Association, by removing and adding stop logs.
- b. Description of Any Warning System in Effect. There is no warning system in effect for Locustville Pond Dam.

#### 4.2 Maintenance Procedures

- a. General. There is no regular program for maintenance of the dam and appurtenances.
- b. Operating Facilities. The sluice gate at the headrace inlet is in fair to good condition and can be used to control the pond level and flow to the headrace. The stoplog structure at the headrace outlet is in poor condition and cannot be considered reliable in controlling the pond level.

#### 4.3 Evaluation

- a. The facility is not regularly maintained, monitored or regulated by the Owner. The outlet works is in poor condition due to decay of the headrace outlet structure. The stop logs on this structure have little support because the wooden support structure is rotted.
- b. There is no low level outlet by which the pond can be drained for maintenance at the dam or in the event of an emergency.
- c. Vegetation in the form of trees and brush is present over the crest, downstream face and downstream toe. The concrete facing over the stone masonry on the upstream face, right abutment and spillway training walls is eroded at the water line and missing.
- d. There is no regularly scheduled maintenance for this dam. There are numerous maintenance deficiencies as described above. A systematic inspection and rehabilitation program should be developed and implemented.

- e. An emergency action plan should also be developed and implemented that includes reservoir dewatering procedures, locations of emergency equipment, materials or manpower to reduce or minimize dam failure damage, authorities to be contacted in emergency situations and a program of surveillance during unusual storm events.

## SECTION 5

### EVALUATION OF HYDRAULIC/HYDROLOGIC FEATURES

#### 5.1 General

Locustville Pond Dam, constructed prior to 1900, is located on Brushy Brook in the Pawcatuck River drainage basin in Rhode Island. This reservoir has a gross drainage area of 11.3 square miles and is located 1,300 feet upstream from the confluence with the Wood River. Basin characteristics of this watershed include moderate slopes with approximately 20% of the basin area covered by natural storages and swamps. There are no gaging stations located in this watershed. The reservoir has a storage capacity of 630 Ac-Ft, a surface area of 90 acres at the spillway crest elevation and a maximum spillway capacity of 1,500 CFS.

This dam has two spillways and a surcharge height of 3 feet above the principal spillway. The right spillway has a length of 64 feet, and the left spillway has a length of 33.8 feet. The total length of dam is 320 feet. The reservoir has a total storage capacity at the spillway crest level of 630 Ac-Ft. Each foot of depth above the spillway level can accommodate 90 Ac-Ft of water equivalent to 0.15 inches of runoff.

The pond level can only be drawn down to 5 feet below the spillway level because of the elevation of the outlet. It is estimated that it would take approximately 12 hours to lower the pond level one foot assuming a surface area of 90 acres and a discharge of 95 CFS. It will take about 5 days to lower the pond to the level of the outlet which is 5 feet below the spillway elevation.

#### 5.2 Design Data

No specific design data is available for the watershed or structures of Locustville Pond Dam. In lieu of existing design information, U.S.G.S. Topographic Maps (Scale 1" = 2,000') were utilized to develop hydrologic parameters such as drainage areas, reservoir surface areas, basin slopes, and other runoff characteristics. Elevation-storage relationships for the reservoir were approximated by assuming the surface area remained constant above the spillway level. Some of the pertinent hydraulic design data was obtained and/or confirmed by actual field measurements at the time of the visual field inspection. Test flood inflow/outflow values and dam failure profiles were determined in accordance with the Corps of Engineers guidelines.



### 5.3 Experience Data

No historical data for recorded discharges or water surface elevations are available for this dam. It was reported that the left abutment of the dam was overtopped during the 1927 flood.

### 5.4 Test Flood Analysis

Recommended guidelines for the Safety Inspection of Dams by the Corps of Engineers were used for selection of the Test Flood. This dam is classified under those guidelines as a HIGH hazard and SMALL in size. Guidelines indicate that a storm event equal to one-half PMF to the full PMF be used as a range of test floods for such a classification. The watershed has a total drainage area of 11.3 square miles, 20% of which is swampy or covered by natural storages. This drainage area is largely wooded and hilly with rolling terrain. The basin slopes average 0.03 feet per foot which are considered moderate. A test flood value was selected from the Corps of Engineers PMF curve for a watershed with rolling topography and reduced by 20% for storage. A test flood equal to the full PMF for this dam was calculated to be 1,200 CSM, or 13,560 CFS and was adopted for this analysis. The full PMF was adopted because of the large numbers of commercial structures located downstream of the dam within the estimated dam failure impact area. Outflow discharges were also developed using the Corps of Engineers criteria for approximate routing procedures. The routed outflow discharge for the test flood inflow was 12,715 CFS with outlet opened. The spillway rating curve is illustrated in Appendix D. Flood routings were performed assuming an initial reservoir pool at the main spillway crest level with a uniform dam crest elevation of 98.1. Calculations indicate the spillway capacity is hydraulically inadequate to pass the routed test flood outflow and this flow will overtop the dam by approximately 4.8 feet. At the top of the dam, the main spillways have a capacity of 1,500 CFS which is 11.5% of the routed test flood overflow discharge. The outlet has a capacity of 140 CFS at the top of the dam.

### 5.5 Dam Failure Analysis

An instantaneous full depth-partial width breach of 60 feet was assumed to have occurred in the dam. This adopted breach width of 60.0 feet was based on 20% of the dam length at mid-height. The calculated dam failure discharge of 8,340 CFS presumes the reservoir level was at the top of the dam before failure and will result in water surface elevations of 11 feet immediately below the dam (about 5.5 feet above the depth just prior to failure). The estimated damage reach extends downstream for a distance of 3,000 feet. Failure of this structure could result in the loss of more than a few lives, inundation of 10-12 residential and commer-

cial structures, substantial erosion along the streambed and potential damage to Rhode Island Route 3 and the dam and bridge on the Wood River. It is estimated that the Wood River Dam would be overtopped by 5 feet. It is also estimated that the depth of water at the inundated dwellings and commercial properties could range from 6-8 feet from the dam failure flow. The prefailure flow of 1,640 CFS will result in flooding stages ranging from 1 to 2 feet in the affected structures. Utility service within the rights of way may also be temporarily disrupted.

It is estimated that the failure discharge will travel downstream through the Brushy Brook and Wood River streambeds with high velocities. As a result of the failure analysis and the potential for loss of more than a few lives, Locustville Pond Dam is judged to be a HIGH hazard structure. The prime impact area subject to flooding damage from a dam failure has been delineated on the Dam Failure Impact Area Map in Appendix D.

## SECTION 6

### EVALUATION OF STRUCTURAL STABILITY

#### 6.1 Visual Observations

The visual observations disclosed evidence of possible structural instability since the downstream stone masonry face between the left and right spillways is irregular and seepage from the toe is occurring in this same area, Station 1+50 to 2+00. Local settlement and depressions on the crest may also indicate possible instability of the upstream face, which was submerged and unobservable at the time of inspection. Trees growing on the crest and in and adjacent to the downstream face of the dam could dislodge stones from the dry stone masonry walls and reduce their stability. Seepage along tree roots could lead to an ultimate piping failure. Seepage through the downstream faces of the spillways and through the right wall of the headrace could induce a piping failure. The right wall of the headrace appears to be in poor condition, although the heavy growth on the downstream side precludes a careful inspection. However, failure of the headrace wall would not cause the downstream hazards.

#### 6.2 Design and Construction Data

There are no design and construction data available.

#### 6.3 Post-Construction Changes

There are no design or construction records of changes made to the dam after construction. However, records of inspections conducted in 1940 by the Division of Harbors and Rivers in Rhode Island indicate that concrete was placed on the upstream and downstream faces of the dam to reduce leakage and improve stability of the stones in the upstream and downstream faces. These inspection reports and other correspondence pertaining to the repairs is included in Appendix B.

#### 6.4 Seismic Stability

The dam is located in Seismic Zone 1, and, in accordance with recommended Phase 1 guidelines, does not warrant seismic stability analysis.

## SECTION 7

### ASSESSMENT, RECOMMENDATIONS AND REMEDIAL MEASURES

#### 7.1 Dam Assessment

- a. Condition. Based on the visual inspection and review of available data, the dam is judged to be in POOR condition.
- b. Adequacy of Information. The information available is such that the assessment of the dam must be based on the visual inspection.
- c. Urgency. The recommendations and remedial measures described below should be implemented within one year after receipt of this Phase 1 inspection report by the Owner.

#### 7.2 Recommendations

The following items should be carried out under the direction of a qualified registered engineer and any recommendations resulting should be implemented by the Owner.

- a. Inspect and evaluate the right spillway when there is no flow over it.
- b. Perform a detailed hydrologic/hydraulic investigation to assess further the potential for overtopping the dam and the need for and the means to increase the project discharge capacity.
- c. Provide a low level outlet at the dam. At present, the dam can only be drained to 5 feet below the spillway level.
- d. Determine the cause of settlement and depressions on the crest.
- e. Determine whether the seepage through the dam at Station 1+55 and the nearby irregularity of the downstream face represent deterioration that could lead to failure. Establish a monitoring program, as necessary.
- f. Remove trees growing on the crest and downstream face of the dam within 15 feet of the downstream face and backfill root holes with appropriate compacted soil.
- g. Evaluate the seepage through the downstream faces of the left and right spillways, and monitor it as necessary.

### 7.3 Remedial Measures

#### a. Operation and Maintenance Procedures

1. Develop an "Emergency Action Plan" that will include an effective preplanned downstream warning system, locations of emergency equipment, materials and manpower, authorities to contact and potential areas that require evacuation.
2. Maintain clear of brush and trees on the crest, downstream face, right wall of the headrace, and within 15 feet of the downstream toe of the dam.
3. Institute a program of annual technical inspection by a qualified registered engineer.
4. Develop a system for the recording of data with regard to items such as: water levels, discharges, time and drawdown to assist those responsible for the monitoring of the structure.
5. Implement a regular maintenance program for the facility.
6. Provide surveillance during and immediately after high intensity rainfall.
7. Repair the stop logs and slots in the headrace outlet structure.
8. Monitor the leaks from the right wall of the headrace so that the Owner will be warned of any worsening of the leaks.
9. Seal the cracks in the crest of the left spillway.
10. Remove the rods sticking through the crest of the left spillway.

### 7.4 Alternatives

There are no practical alternatives to the recommendations of Sections 7.2 and 7.3.

APPENDIX A  
INSPECTION CHECKLIST

1

VISUAL INSPECTION CHECKLIST  
PARTY ORGANIZATION

PROJECT LOCUSTVILLE POND DAM, RI 01408  
Hope Valley, Rhode Island

DATE Nov. 25, 1980

TIME 0800

WEATHER Partly sunny - 55°

W.S. ELEV. 95.0 U.S. 81.0 DN.S.

PARTY:

- |  |           |
|--|-----------|
| 1. <u>David Sluter - New England Engineering</u> | 6. _____  |
| 2. <u>Stephen Fodor - New England Eng.</u>       | 7. _____  |
| 3. <u>Steve J. Poulos - GEI</u>                  | 8. _____  |
| 4. <u>Robert E. Stetkar - GEI</u>                | 9. _____  |
| 5. _____   | 10. _____ |

PROJECT FEATURE	INSPECTED BY	REMARKS
1. <u>Geotechnical</u>	<u>S. J. Poulos, R. E. Stetkar</u>	
2. <u>Civil</u>	<u>D. Sluter, S. Fodor</u>	
3. <u>Hydrologic/Hydraulic</u>	<u>D. Sluter</u>	
4. _____		
5. _____		
6. _____		
7. _____		
8. _____		
9. _____		
10. _____		

# PERIODIC INSPECTION CHECKLIST

PROJECT LOCUSTVILLE POND DAM DATE Nov. 25, 1980

PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_

DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

AREA EVALUATED	CONDITION
<u>DAM EMBANKMENT</u>	Note: It had rained on previous day.
1. Crest Elevation	98.1
2. Current Pool Elevation	95.0
3. Maximum Impoundment to Date	Unknown
4. Surface Cracks	None observable.
5. Pavement Condition	None. Brush over most of crest. Some grass and bare spots.
6. Movement or Settlement of Crest	Settlement relative to upstream face: 21 ft @ Sta 0+67 and 1+58 to 1+70. Sinkholes along upstream face at 0+14, 0+27, 0+67, 0+71, 1+58, 1+95, 2+07 (last 3 ft deep; others 6 to 8 in. deep).
7. Lateral Movement	Upstream - not observable. Downstream - Irregular stone wall. See 13.
8. Vertical Alignment	Irregular. See 6.
9. Horizontal Alignment	See 7.
10. Condition at Abutment and at Concrete Structures	Right Abutment: Not observable downstream. Left Abutment: Not observable due to sluiceway and owner's buildings.
1. Indications of Movement of Structural Items on Slopes	No structural items on slopes.
2. Trespassing on Slopes	Faces are nearly vertical. Free access to crest.
3. Sloughing or Erosion of Slopes or Abutments	Abutments satisfactory. Downstream face irregular. In some places rock face is vertical, others slightly sloped, others 4 ft vertical then sloped back.
Rock Slope Protection - Riprap Failures	Upstream concrete and rock face satisfactory above water level. Concrete eroded at water level.
Unusual Movement or Cracking at or Near Toe	None observed.



2A

## PERIODIC INSPECTION CHECKLIST

PROJECT LOCUSTVILLE POND DAM DATE Nov. 25, 1980  
PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_  
DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

AREA EVALUATED	CONDITION
<u>DAM EMBANKMENT (CON'T.)</u>	
Unusual Embankment or Downstream Seepage	Ponded water Sta 1+50 to 2+00. Rusty stain at Sta 1+55. Outflow from ponded zone totals about 2 gpm and is clear.
Piping or Boils	None observed.
Foundation Drainage Features	None.
Toe Drains	None.
Instrumentation System	None.
Vegetation	Brush and trees to 5 in. diameter on most of crest. Trees to 14 in. diameter just a few feet downstream from toe. Stumps and trees growing from downstream face, particularly at downstream crestline Sta 0+95 to 1+00.

# PERIODIC INSPECTION CHECKLIST

PROJECT LAURETTEVILLE FORD DAM DATE Nov. 25, 1980  
 PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_  
 DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

AREA EVALUATED	CONDITION
<u>DIKE EMBANKMENT</u> Crest Elevation Current Pool Elevation Maximum Impoundment to Date Surface Cracks Pavement Condition Movement or Settlement of Crest Lateral Movement Vertical Alignment Horizontal Alignment Condition at Abutment and at Concrete Structures Indications of Movement of Structural Items on Slopes Trespassing on Slopes Sloughing or Erosion of Slopes or Abutments Rock Slope Protection - Riprap Failures Unusual Movement or Cracking at or Near Toes Unusual Embankment or Downstream Seepage Piping or Boils Foundation Drainage Features Toe Drains Instrumentation System Vegetation	No dike embankment.

June 22, 1945.

Saybrooke Manufacturing Co.,  
West Warwick, R. I.

Att: Mr Barish:

Re: Locustville Dam  
Hope Valley, R. I.

Gentlemen:-

Inspections made by Engineers of this Division result in the opinion that repairs, which have been made at the Locustville Dam since September, 1937, have been effective in stopping the major portion of the leakage and so long as conditions remain as they are to-day, it appears safe to maintain the pond at spillway level with the special condition that, at times of heavy runoff, the gates must be opened to supplement the discharge of the spillways.

Yours very truly,

Frank M. O'Donnell,  
Chief, Division Harbors and Rivers

June 22, 1945.

Senator Frank J. Smith,  
Hope Valley, R. I.

Dear Senator Smith:-

Re: Locustville Dam  
Hope Valley, R. I.

Due to the past interest shown by the Town of Hopkinton and yourself in the condition of the Locustville Dam in the village of Hope Valley, R. I., this office wishes to advise you that we have followed the condition of this dam since 1939, and the owner is being advised that the most recent inspection made by this Division has resulted in the opinion that the repairs which have been made have been effective in stopping the major portion of the leakage and so long as conditions remain as they are to-day, it appears safe to maintain the pond at spillway level provided, however, that in times of heavy runoff the gates will be opened to supplement the discharge of the spillways.

Yours very truly,

Frank M. O'Donnell,  
Chief, Division Harbors and Rivers

August 23, 1965

MEMORANDUM

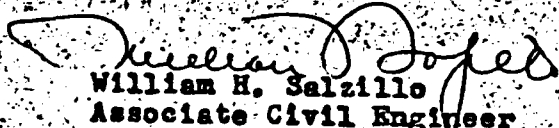
TO: Mr. Henry Ise, Chief, Division of Harbors & Rivers  
FROM: William H. Salzillo, Assoc. Civil Engineer  
SUBJECT: Locustville Dam, Hopkinton, R. I.

Pusuant to instructions the undersigned made an inspection of subject dam. Said inspection disclosed the following:

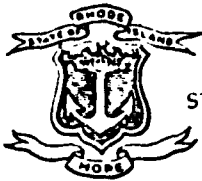
- (1) Pond filled but not going over spillways
- (2) Water level approx. 2' from edge of spillways
- (3) Gates in trench open and damaged causing run off of water
- (4) There is no appearance that dam is being utilized for mill operation
- (5) Concrete wall of dam on pons side in bad need of repairs.

I was unable to locate anyone in the area who had any information concerning operation of mill or dam. I was able to get this comment. "No water has come over the spillways for the last five years."

It is the opinion of the undersigned that unless the gates, leading to trench and in trench, are not closed and repaired there will never be any chance of pond filling to spillway level causing run off at this point.

  
William H. Salzillo  
Associate Civil Engineer

WES:ns



STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
75 Davis Street  
Providence, R. I. 02908

*To: Earle  
for file  
opa  
3/27/80*

RECEIVED

MAR 27 1980

ENVIRONMENTAL MANAGEMENT  
WETLANDS SECTION

21 March 1980

Mr. Kenneth Taylor  
Auralux Chemical Assoc., Inc.  
Main Street  
Hope Valley, R.I. 02832

Re: Locustville Dam  
R.I. Dam # 262

Dear Mr. Taylor:

The State of Rhode Island, through its Department of Environmental Management, is currently conducting safety inspections of dams throughout the State in accordance with guidelines established under the General Laws of Rhode Island, Section # 46-19-4.

It is the responsibility of the Dams Section, Division of Land Resources, to perform these inspections and evaluations as they pertain to the potential hazards to human life and property.

As owner of the Locustville Dam, Rhode Island Dam # 262, please be advised that personnel of this office recently inspected the subject dam. On the basis of their visual examination, the dam appears to be in generally fair condition. The deficiencies noted below, however, indicate that rehabilitation and/or repair of this structure is warranted and that a specific program of remedial work should be initiated. The major concern regarding the overall integrity of the dam are as follows:

- 1) Excessive scouring of concrete along waterline adjacent to (and upstream of) gate structure.
- 2) Many trees and shrubs growing out of masonry/block retaining wall along face of spillway area.

*note for  
followup*

It is requested you inform this office of your intentions as they pertain to this matter no later than April 4, 1980. Also, may I suggest you direct your communications relative to this matter to Earle F. Prout, Jr. Dams Section of this Division, telephone number 277-6820, 83 Park Street, Providence, R.I. 02903.

Very truly yours,

*Peter M. Janaros P.E.*  
Peter M. Janaros, P.E. Chief  
Division of Land Resources

PMJeb

cc: Carmine Asprinio, Dams Section

APPENDIX B-1

SELECTED COPIES OF PAST INSPECTION REPORTS

APPENDIX B  
ENGINEERING DATA



# PERIODIC INSPECTION CHECKLIST

PROJECT LOCUSTVILLE POND DAM DATE Nov. 25, 1980  
 PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_  
 DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

AREA EVALUATED	CONDITION
<u>OUTLET WORKS - SERVICE BRIDGE</u>	N/A
a. Super Structure	
Bearings	
Anchor Bolts	
Bridge Seat	
Longitudinal Members	
Underside of Deck	
Secondary Bracing	
Deck	
Drainage System	
Railings	
Expansion Joints	
Paint	
b. Abutment & Piers	
General Condition of Concrete	
Alignment of Abutment	
Approach to Bridge	
Condition of Seat & Backwall	

PERIODIC INSPECTION CHECKLIST	
PROJECT LOCUSTVILLE POND DAM	DATE Nov. 25, 1980
PROJECT FEATURE	NAME
DISCIPLINE	NAME
AREA EVALUATED	CONDITION
<p><u>OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS (CON'T.)</u></p> <p>Other Obstructions</p> <p>Other Comments</p>	<p>MAIN SPILLWAY - RIGHT SIDE OF DAM</p> <p>Various debris dumped into channel from right side. Discharge channels for main and secondary spillways separated by high ground containing waste disposal pond.</p>

8B

# PERIODIC INSPECTION CHECKLIST

PROJECT LOCUSTVILLE POND DAM DATE Nov. 25, 1980  
 PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_  
 DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

AREA EVALUATED	CONDITION
<u>OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS</u>	<u>SECONDARY SPILLWAY - LEFT SIDE OF DAM</u> TOP EL. 95.4
a. Approach Channel	
General Condition	Satisfactory.
Loose Rock Overhanging Channel	None.
Trees Overhanging Channel	None.
Floor of Approach Channel	Under water and not observable.
b. Weir and Training Walls	Weir - poor. Cracks and voids in top of spillway weir allowing seepage into weir. Training Walls - poor. Concrete eroded at water level on both training walls. See photo.
General Condition	None observed.
Rust or Staining	None observed.
Spalling	Spalling on training walls at water level
Any Visible Reinforcing	None visible.
Any Seepage or Efflorescence	Seepage generally through downstream face of spillway between Sta 0+50 and right abutment. Larger seep at Sta 0+54 ~5 ft below spillway crest flowing clear at ~5 gpm. Continuous clear seepage near toe of downstream face at contact with left abutment.
Drain Holes	
c. Discharge Channel	
General Condition	Fair.
Loose Rock Overhanging Channel	None.
Trees Overhanging Channel	Discharge channel forested with large trees.
Floor of Channel	Natural stream bed with boulders and some bedrock.
Other Obstructions	Some fallen trees and miscellaneous debris in channel.
Other Comments	

# PERIODIC INSPECTION CHECKLIST

PROJECT LOXESTVILLE POND DAM DATE Nov. 25, 1980

PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_

DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

AREA EVALUATED	CONDITION
<u>OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS</u>	<u>MAIN SPILLWAY - RIGHT SIDE OF DAM</u> <u>TOP EL. 95.0</u>
a. Approach Channel	
General Condition	Satisfactory.
Loose Rock Overhanging Channel	None.
Trees Overhanging Channel	Minor, on right side of channel.
Floor of Approach Channel	Under water, not observable.
b. Weir and Training Walls	
General Condition	Weir - satisfactory. Left Training Wall - concrete face eroded and in poor condition. Right Training Wall - masonry wall in fair condition.
Rust or Staining	None observed.
Spalling	Concrete face on left training wall badly spalled.
Any Visible Reinforcing	None visible.
Any Seepage or Efflorescence	Seepage from beneath 3-in.-diameter tree growing through masonry face at spillway left abutment; flowing clear at less than 1 gpm. Left half of downstream face of spillway obscured by overflow and not observable. Continuous seepage from right half of spillway face from bottom to ~2 ft below crest; flowing clear with total volume 1-2 gpm.
Drain Holes	N/A.
c. Discharge Channel	
General Condition	Fair.
Loose Rock Overhanging Channel	None.
Trees Overhanging Channel	Discharge channel is forested with large trees.
Floor of Channel	Natural stream channel with boulders and some bedrock.

# PERIODIC INSPECTION CHECKLIST

PROJECT LOCUSTVILLE POND DAM DATE Nov. 25, 1980  
 PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_  
 DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

AREA EVALUATED	CONDITION
<u>OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL</u>	Abandoned.
General Condition of Concrete	Formerly water passed into mill and out through the outlet structure. Headrace was subsequently plugged with soil and concrete and the weir in the right wall of the headrace is now used to control pond level. See previous page.
Rust or Staining	N/A.
Spalling	N/A
Erosion or Cavitation	N/A
Visible Reinforcing	N/A
Any Seepage or Efflorescence	N/A
Condition at Joints	N/A
Drain holes	None.
Channel	Natural stream bed.
Loose Rock or Trees Overhanging Channel	Forested. Many trees and debris in channel.
Condition of Discharge Channel	Poor.

# PERIODIC INSPECTION CHECKLIST

PROJECT LOCUSTVILLE POND DAM DATE Nov. 25, 1980  
 PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_  
 DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

AREA EVALUATED	CONDITION
<u>OUTLET WORKS - HEADRACE</u>	
General Condition of Walls	Concrete lining in good condition where observable above water. Stone walls partially re-pointed, but grout missing in many zones.
Rust or Staining on Concrete	None.
Spalling	None observed.
Erosion or Cavitation	None observed.
Cracking	At angle point and at two joints there are cracks 1/8 in. wide.
Alignment of Monoliths	N/A.
Alignment of Joints	Good.
Numbering of Monoliths	N/A.
Seepage from Right Wall	Seepage at 20 to 40 gpm emerging from right wall of headrace through zone from dam to about 30 ft downstream. Water is clear. It appears that the concrete liner was added to stop seepage at some time in the past. Not completely successful.
Spillway at Downstream End of Headrace	
Spillway Concrete	Eroded. Aggregate showing. Flashboards no longer usable.
Stoplogs and Slots	Wooden. Poor condition. Left side rotted away. Water pressure is holding logs in place.
Note Concerning Right Wall of Headrace	Right wall appears to be a stone wall on top of a low dike but brush obscures it.

## PERIODIC INSPECTION CHECKLIST

PROJECT LOCUSTVILLE POND DAM DATE Nov. 25, 1980  
 PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_  
 DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

AREA EVALUATED	CONDITION
<u>OUTLET WORKS - CONTROL TOWER</u>	
a. Concrete and Structural	
General Condition	Fair to poor.
Condition of Joints	N/A.
Spalling	Slightly spalled.
Visible Reinforcing	.
Rusting or Staining of Concrete	
Any Seepage or Efflorescence	
Joint Alignment	
Unusual Seepage or Leaks in Gate Chamber	
Cracks	Surface contains 1/8-in.-wide cracks.
Rusting or Corrosion of Steel	
b. Mechanical and Electrical	
Air Vents	None.
Float Wells	None.
Crane Hoist	None.
Elevator	None.
Hydraulic System	None.
Service Gates	1 1/2-in.-thick wood gate operated by rack and pinion in fair to poor condition.
Emergency Gates	None.
Lightning Protection System	None.
Emergency Power System	None.
Wiring and Lighting System	None.

# PERIODIC INSPECTION CHECKLIST

PROJECT LOCUSTVILLE POND DAM DATE Nov. 25, 1980  
 PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_  
 DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

AREA EVALUATED	CONDITION
<u>OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE</u> a. Approach Channel Slope Conditions Bottom Conditions Rock Slides or Falls Log Boom Debris Condition of Concrete Lining Drains or Weep Holes b. Intake Structure Condition of Concrete Stop Logs and Slots	<p>This channel leads to headrace formerly used for water to factory.</p> <p>Concrete training walls on left and right. Portions of concrete at water level are absent. Rock walls exposed behind former concrete. Under water. None..</p> <p>None.</p> <p>Minor leaves and pine needles.</p> <p>See "Slope Conditions."</p> <p>None.</p> <p>It appears that the intake structure may have been installed in the headrace for control purposes, or to replace older intake. The observable structure is concrete with brick aggregate.</p> <p>Upstream - None. Downstream - No logs. Two sets of slots for 6-in.-thick stoplogs. Good condition at top 2 ft, not observable under water.</p>



OFFICE OF O. PERRY SARLE, CIVIL ENGINEER, PROVIDENCE, R. I.

June 13, 1945.

Mr. Frank M. O'Donnell,  
Chief of the Division of Harbors & Rivers,  
State Office Building, Providence, R.I.

Dear Mr. O'Donnell,-

An inspection made at the Locustville dam by J.V. Kiley and myself on the 14th inst results in finding that the work done on the dam and gates has stopped many leaks through the face walls, which existed in September 1939, when Geo. H. MacLean as Chief of the Division of Harbors & Rivers, issued certain orders for the control of the waters passing through Locustville pond, and that the gates are in fair workable condition.

The leakage through the trench wall just below the gates is apparently the same as it was in September 1939. Breaking of this wall will not develop a condition of danger on the stream below the gates as the gate openings will control the volume of the stream being discharged irrespective of the condition of the wall.

With the water in the pond standing at spillway level there was no visible leakage on the 14th through the stone face wall of the east spillway. There was at the time of this inspection a small overflow on the west spillway which might hide any small leaks through the stone wall facing of this spillway; but if any such existed there were none which spouted through the slight nappe.

In general the repairs are crudely made and the material used is too poor in quality for securing long enduring correction of this leakage. But they will be effective for some period of time.

The situation then seems to be that so long as conditions remain as good as they now are the pond may be filled without creating a danger and the MacLean order may be modified accordingly. If modification of the order is made the fact that the spillways have been slightly raised in the process of repairs should be taken into account and the owner required to compensate for this loss of discharging capacity by opening the gates during heavy runoff, to such extent as is necessary to prevent surcharge of the spillways.

JUN 15 1945 Respectfully,

*O. Perry Sarle*  
Consulting Engineer.



DIVISION  
HARBORS & RIVERS

*to J.V.K.*

R. I. DEPARTMENT OF PUBLIC WORKS  
DIVISION OF HARBORS & RIVERS

SPECIAL INSPECTION REPORT

DATE: JUNE 14, 1945

INSPECTED BY: J. V. KEILY

O. PERRY SARLE

767 *temp*  
DAM No. 262 NAME LOCUSTVILLE DAM

TOWN OR CITY HOPKINTON

ON BRUSH BROOK

BROOK  
RIVER  
TRENCH

PANCATUCK

WATERSHED

OWNER

MR. BARISH

ADDRESS

WEST WARWICK, R. I.

C/C SAYBROOKE MANUFACTURING COMPANY

3/L3/47 - PRESENT OWNER - ~~WILTON N. GILMAN & SON, HOPE VALLEY, REG. TEL. HW 124~~

REPORT ON 9/25/47

Walter H. Voos, c/o Voos Co., New Haven, Ct.

• NEW CONSTRUCTION

PLANS BY:

REPAIRS

PERMIT GRANTED:

INSPECTION ONLY X

CONTRACTOR:

9-25-47  
HOPKINTON—The Saybrook Mill property in Hope Valley has been sold to Walter H. Voos, president of the Voos Company of New Haven, a kitchen cutlery manufacturer, a deed filed yesterday revealed. Water rights and a 10-acre tract of land near the mill property also were purchased. The Saybrook plant, formerly making woolen goods, was ruined by fire a number of years ago. *From Bulletin*  
NEWPORT—Memorial services

INSPECTION REPORT:

POND FULL AND GOING OVER SPILLWAY AT WEST END WITH ABOUT 1" HEAD; GATES CLOSED AT TRENCH.

MR. SARLE FOUND DAM IN MUCH BETTER SHAPE THAN WHEN VIEWED IN 1939 AT TIME ORDER WAS ISSUED TO LOWER POND LEVEL.

MOST OF LEAKS HAVE NOW BEEN FILLED, CONCRETE (OF POOR QUALITY) PLACED ALONG WALL OF DAM ON POND SIDE, SPILLWAYS CAPPED WITH MORTAR AND GATES REPAIRED.

LEAK IN TRENCH BELOW DRAW-OFF GATES STILL IN EVIDENCE, BUT APPARENTLY DOING NO HARM AS WATER IS CLEAR AND CARRIES NO SEDIMENT.

CONCLUSION REACHED THAT, IF CONDITIONS CONTINUE AS AT PRESENT, THE POND CAN BE FILLED TO SPILLWAY LEVEL WITHOUT DANGER EXCEPT THAT <sup>AT</sup> TIME OF HEAVY RUN-OFF THE GATES MUST BE OPENED TO HELP SPILLWAYS DISCHARGE THE WATER.

A LETTER TO THIS EFFECT IS SUGGESTED BE SENT TO THE OWNER, MR. BARISH, AND ALSO TO SENATOR FRANK L. SMITH OF HOPKINTON TO ADVISE HIM OF THIS DECISION.

3/L3/47

SOUTH SPILLWAY CLEAN, 4" OVER; NORTH SPILLWAY CLEAN, 5" OVER. NEW CONCRETE CREST PUT IN PLACE, 1946. COST \$600.00. TWO GATES IN NORTH TRENCH CLOSED AND FAIRLY TIGHT FACING ON EMBANKMENT SPALLING AT WATER LINE. WATER 30" BELOW CENTER OF EMBANKMENT OF DAM, (TOP OF WALL) TO-DAY. SALE OF MILL AND DAM REPORTED; NOT COMPLETED TO-DAY. WATER WHEEL IN MILL NEW AND AVAILABLE for power production (see new owner above)

100-152588-1

100-152588-1

100-152588-1

R. I. DEPARTMENT OF PUBLIC WORKS  
DIVISION OF HARBORS & RIVERS

SPECIAL INSPECTION REPORT

DATE: JUNE 4, 1945

INSPECTED BY: J. V. KEILY

SENATOR SMITH  
AND LOCAL RESIDENT

*P-67 temp 262*  
DAM No. *262* NAME LOCUSTVILLE

TOWN OR CITY HOPKINTON

ON

*Bursley Br.*

~~BROOK  
CITY  
TACON~~

PAWCATUCK

WATERSHED

OWNER MR. BARISH C/C SAYBROOKE MFG CO

ADDRESS

WEST WARWICK, R. I.

REPORT ON

NEW CONSTRUCTION

REPAIRS

INSPECTION ONLY ☒

PLANS BY:

PERMIT GRANTED: ☐

CONTRACTOR:

INSPECTION REPORT:

SENATOR SMITH OF HOPKINTON REPORTED THAT WATER HAD BEEN DRAWN DOWN TO A LOW POINT OF 4-5 FEET BELOW THE NORMAL LEVEL RESULTING IN EXPOSURE OF MUD ALONG BANKS OF POND WITH ATTENDANT BAD ODORS; THIS WAS DISTASTEFUL TO LOCAL RESIDENTS AND SUMMER CAMPERS ON SHORES OF POND.

J. V. KEILY CALLED ON SENATOR SMITH AND HE TOOK ONE OF THE LOCAL RESIDENTS WITH HIM TO INDICATE LEAKS AT DAM. UPON ARRIVAL AT SITE, IT WAS FOUND THAT THE GATES AT TRENCH WERE NOW CLOSED AND THE WATER IN POND WAS RISING SLOWLY. ONE LEAK HAD BEEN REPAIRED BY MAKING A SMALL PATCH WITH CEMENT LESS THAN <sup>3</sup>/<sub>59</sub> FT. IN EXTENT. THIS MAY HAVE BEEN THE REASON FOR DRAWING DOWN THE POND DURING THE PAST WEEK.

INSPECTIONS OF THE RETAINING WALL (SOME 100 FEET LONG) BETWEEN THE EAST AND WEST SPILLWAYS AND THE EAST WING WALL INDICATED THAT THE CONCRETE FACING PLACED IN FRONT OF MASONRY WALLS TO TIGHTEN SAME HAD BADLY ERODED FOR A LENGTH OF 2 FEET BELOW NORMAL POND LEVEL AND THE DEPTH OF DEPRESSION (CAUSED BY FLAKING OFF OF CONCRETE) WAS FULLY 6" IN PLACES. SEVERAL PEICES OF THIS CONCRETE WAS TAKEN TO OFFICE AS SAMPLES OF INFERIOR QUALITY OF CEMENT. APPARENTLY A POOR GRADE OF SAND AND VERY LITTLE CEMENT WAS USED IN THE CONCRETE FACING.

REPAIRS WOULD REQUIRE JUST A FEW YARDS OF STRONG CONCRETE AND FORMS TO HOLD SAME IN PLACE.

*concrete*  
NO IMMEDIATE DANGER, BUT WORK SHOULD BE DONE BEFORE BREAKS THRU DAM START AGAIN. LEAK FROM TRENCH BELOW GATE STILL IN CONSIDERABLE VOLUME *with pond* <sup>1</sup>/<sub>2</sub> FT. BELOW CREST OF DAM.

RECOMMENDATIONS WAIT UNTIL POND IS FILLED TO SEE CONDITION OF LEAKS AT FULL HEAD.

**CAUTION TO TOWN OFFICIALS IF THEY HAVE ASSUMED CONTROL OF GATES, ETC.**

DATE: 4.21.05

PROJECT: 101.000.000.000

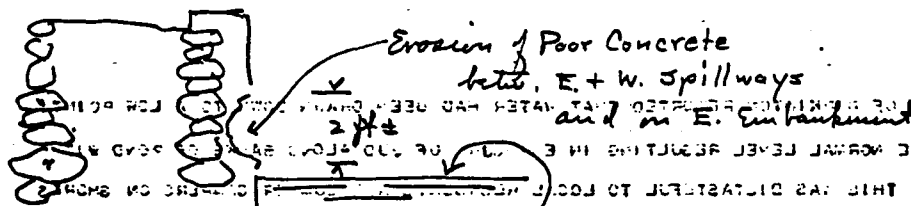
NAME: J. J. J. J. J.

NTIME: 10.00

THESE: 10.00

**SKETCHES OF SPECIAL CONDITIONS AT TIME OF INSPECTIONS**

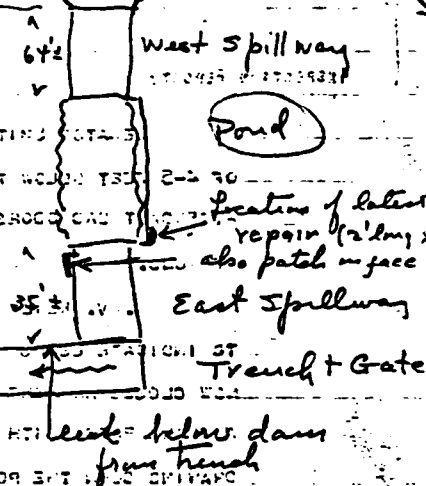
**Cross Section thru Dam**



Present water level

1 1/2 - 2 ft. below crest of Dam

**Plan**



INSPECTION OF THE RETAINING WALL (SOME 100 FEET LONG) BETWEEN THE EAST AND WEST SPILLWAYS AND THE EAST RIVER WALL INDICATED THAT THE CONCRETE FACED PLACED IN FRONT OF THE WALLS TO TIGHTEN SAME HAD BEEN CRACKED FOR A LENGTH OF 5 FEET BELOW NORMAL POND LEVEL AND THE BIRTH OF DEPRESSION (CAUSED BY FLAKING OFF OF CONCRETE) WAS FULLY IN PLACES. SEVERAL PORTIONS OF THIS CONCRETE WAS TAKEN TO OFFICE AS SAMPLES OF INTERIOR QUALITY OF CONCRETE. APPROXIMATELY A FOUR INCH CRACK WAS OBSERVED IN THE CONCRETE FACED IN THE CONCRETE.

**PREVIOUS REPORTS ON SAME PROJECT:**

See Records Locustville P-67

INSPECTED BY: J. J. J. J. J.  
TITLE: Engr.

DATE: 6/14/05

Derrick V. Waterman

DIVISION OF HARBORS AND RIVERS

Frank M. O'Donnell  
CHIEF

February 23, 1940.

Saybrooke Manufacturing Company,  
West Warwick, R. I.

Attention Mr. Parish:

Re: Hope Valley Dam

Dear Sirs:-

We are in receipt of your letter of the 20th inst, in which you advise that the gate at your Hope Valley dam has been repaired and is in good working condition.

You appreciate that the object of rectifying this gate is to produce a condition for operating the same in manner to control the height of the pond to an extent which will prevent damage to persons or property whenever freshet conditions occur. To accomplish this you are to keep the gate wide open during the months of the year in which freshets ordinarily occur. You will serve your own interests best to carefully attend to having this gate opened and left open as above required, thus possibly avoiding some liability in case of damage by an unexpected freshet.

The operation of this gate, from time to time, will be your responsibility, but this Division will make such inspections as appear advisable and will make further regulations for the control of this pond in case inspections indicate, from time to time, that such further regulations should be made in the interest of public safety and for avoiding damage to property.

Yours very truly,

Frank M. O'Donnell, Chief  
Division Harbors and Rivers

SAYBROOKE MANUFACTURING CO., Inc.

WOOLENS

HOPE VALLEY West Warwick  
RHODE ISLAND

2/20/40

R. I. Dept. of Public Works  
Division Harbors and Rivers  
Providence, R. I.

Attention: Mr. O'Donnell

Gentlemen:

This is to advise that in accordance with your letter of January 5, we have repaired the gate at our Hope Valley dam and it is in good operating condition.

Yours truly,

Saybrooke Mfg. Co., Inc.

*Norbert Touchette*

SB:ID

DIVISION HARBORS AND RIVERS

XXXXXXXXXXXXXXXXXXXX

Federick V. Waterman

Frank M. O'Donnell  
CHIEF

January 5, 1940

Mr. Sol Barish,  
Royal Mills,  
Riverpoint, R. I.

Re: Hope Valley Dam

Dear Mr. Barish:-

We beg to acknowledge your letter of January 3, 1940.

You will recall that in letters dated September 14 and 28, 1939, you were directed to remove the inoperative gate at the above dam on or before October 15, 1939.

Again on November 15, at a conference in Mr. Sarle's office, your attention was called to the existing danger due to the inoperative condition of the gate, and you promised to remove the gate (only a part of which had been removed) and to investigate the cost of replacing it and if the cost would not be excessive you would rebuild it.

Your letter of January 3 states that "in the next few weeks you will remove a couple of boards."

This statement is not following the order given last September or in accordance with your promise of November 15, 1939.

The responsibility placed by law on this office compels us to advise you that an inspection will be made of the gate on February 1, next, and if the order to remove the gate has not been completed, we will hand the matter over to the Attorney General's office.

We would regret the necessity of taking such a step, but you leave us no alternative.

Yours very truly,

Chief Division Harbors and Rivers.





State of Rhode Island and Providence Plantations

DEPARTMENT OF PUBLIC WORKS

STATE OFFICE BUILDING

DIVISION OF HARBORS AND RIVERS

CHARLES F. McELROY  
DIRECTOR

JOHN V. KELLY  
ASSISTANT DIRECTOR

ROBERT LYNCH, C. E.  
CHIEF OF DIVISION

RECEIVED

ANSWERED

DIVISION OF ROADS AND BRIDGES  
DIVISION OF PUBLIC BUILDINGS  
DIVISION OF STATE AIRPORTS  
DIVISION OF HARBORS AND RIVERS

PROVIDENCE, November 16, 1939.

Division of Harbors and Rivers,  
State Office Building,  
Providence, R.I.

Dear Mr. O'Donnell,-

Mr. MacLean's determination of 2000 c.f.s. as a proper capacity for discharge at Locustville dam, Hope Valley, was made before our investigation of Yawgog and Wincheck. This figure was based on my advice to him that means to discharge not less than 150 c.f.s. per square mile of drainage area should be provided at Locustville dam. Subsequent investigation revealed that extreme freshets can be held back in Yawgog and Wincheck by keeping the ponds drawn down as he has ordered. The total drainage area above Locustville dam is 12 square miles. The combined drainage area of Yawgog and Wincheck is 2.85 square miles. This leaves 9.15 sq. mi. of drainage area to be taken care of at Locustville dam in an extreme freshet.

I have no measurements of the spillways and trench but from inspection judge the two spillways will total 90 feet long and have a depth of two feet to discharge water and that the trench may discharge a stream 5x6 feet section at a velocity of 8 feet per second. I estimate the pond area from the state map as 115 acres. By holding the water four feet below the spillway level the pond will have a volume of 115 acres six feet deep to be filled. On the basis that this fills in 36 hours the quantity of water under control is;

Spillways ----- 900 cubic feet per second.  
Trench ----- 240  
Pond storage ----- 232

Total ----- 1372 cubic feet per second.  
1372 c.f.s. is equal to 159 c.f.s. per sq. mi. on 9.15 sq. mi. of drainage area and taking into account the control at Yawgog and Wincheck meets the basis fixed at the beginning of the consideration of this problem. Hence if the pond is kept down four feet and the trench is kept open for discharging water I think our demands are satisfied.

I think it would be well in order to make a record of the progress of this matter for you to write these people about as indicated in the enclosed suggestion.

I enclose a sketch showing the basic data involved in the above computations.

Very truly,

D. Perry Parker



Frederick V. Waterman  
\*\*\*\*\*

DIVISION HARBORS AND RIVERS  
\*\*\*\*\*

George H. MacLean  
CHIEF

September 28, 1939.

*ish*  
Mr. Solomon Barush,  
Royal Mills,  
Riverpoint, R. I.

Dear Sir:-

Another inspection of the dam at Hope Valley at the plant of the Saybrooke mill made on September 26th revealed that the inoperative gate had not been removed.

As freshet conditions cannot be predicted and might cause considerable damage to property if they occurred while the dam is in its present condition, we must ask you to remove the gate and draw off the pond on or before Oct. 15, 1939.

Of course care will have to be used in doing this to avoid damage which would result from a sudden rush of the impounded waters.

Will you please acknowledge the receipt of this order and that of September 14, 1939.

Very truly yours,

*MacLean*

GHM/T

CHIEF DIVISION HARBORS AND RIVERS

Frederick V. Waterman

DIVISION HARBORS AND RIVERS

EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE

George H. MacLean  
CHIEF

September 14, 1939.

*Barush*  
Mr. Solomon Barush,  
Royal Mills,  
Riverpoint, R. I.

Dear Sir:-

The Town Council of the town of Hopkinton has complained to this Division of "the hazardous condition of the mill dam in the village of Hope Valley. This dam is the property of the Saybrook Manufacturing Company."

An inspection of this dam on September 7th revealed the following condition:

The gate at the easterly end of the dam is closed and in an inoperative condition and the channel leading from the gate contains a considerable amount of debris obstructing the flow of the water.

There is evidence of leaks through the embankment on the westerly side of the channel leading from the waste gate which should be investigated and repaired. At the present time there is no indication of erosion of the embankment, but this condition should not be allowed to continue for any considerable length of time.

The earth embankment of the outlet channel and the down stream face of the dam have a considerable growth of brush and small trees, which should be cleaned away to prevent roots from creating possible channels for leaks through the embankment.

The provision for taking care of extremely high water such as occurred in 1927 and 1936 do not appear to be adequate. We are informed that the pond overflowed the easterly bank, particularly in the flood of 1927.

In view of the above it becomes the duty of this Division under Chapter 638 of the General Laws of 1938, to require you to remove the waste gate at the easterly end of the dam, clear the channel from this gate of all obstructions to the unrestricted flow of water, and present plans for approval of this Division for provision for the safe discharge from the mill pond of not less than 2000 cubic feet per second.

Very truly yours,

*MacLean*

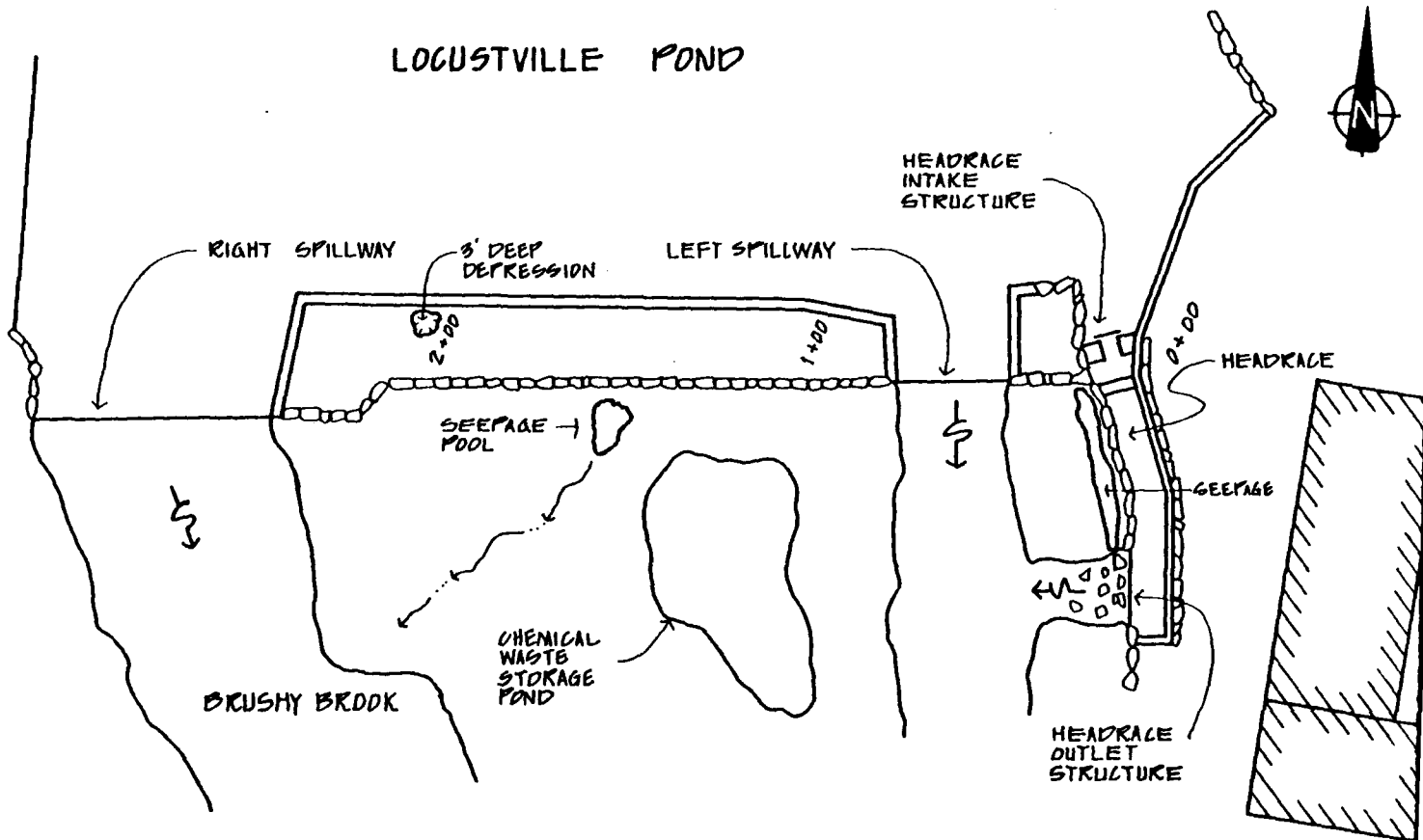
GMM/T

CHIEF DIVISION HARBORS AND RIVERS

APPENDIX B-2

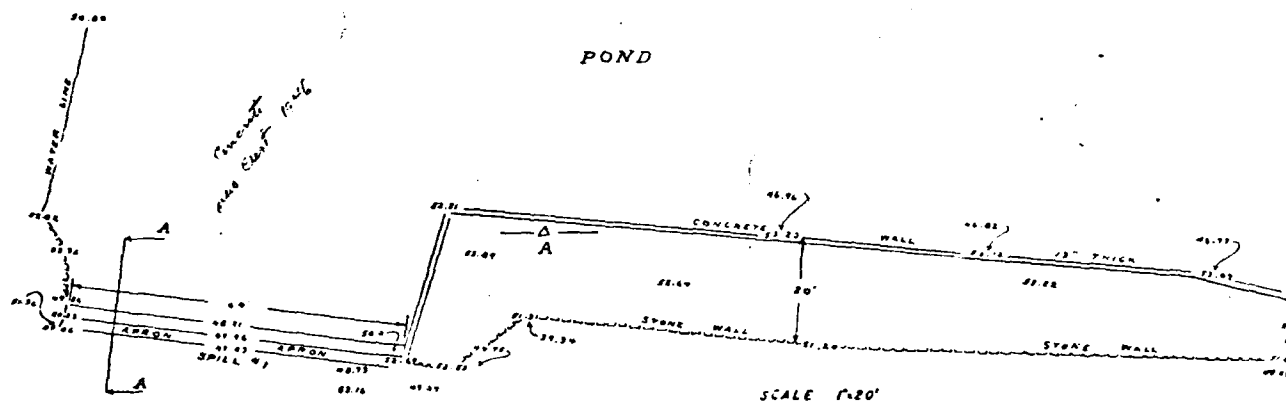
PLANS, SECTIONS AND DETAILS

# LOCUSTVILLE POND



LOCUSTVILLE POND DAM  
GENERAL PLAN • NO SCALE

N

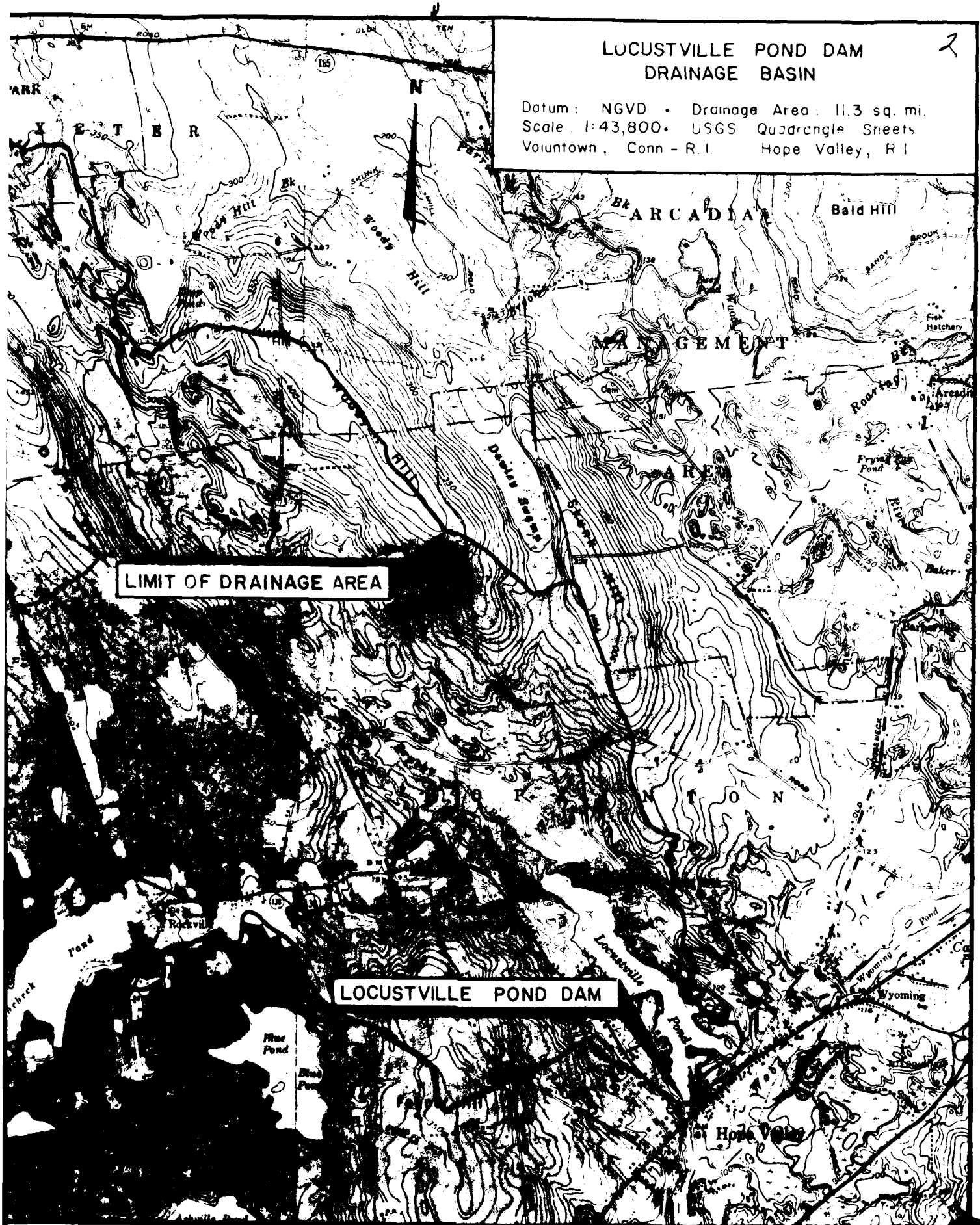


LOCUSTVILLE POND DAM  
DRAINAGE BASIN

Datum: NGVD • Drainage Area: 11.3 sq. mi.  
Scale: 1:43,800. USGS Quadrangle Sheets  
Voughttown, Conn - R.I. Hope Valley, R.I.

LIMIT OF DRAINAGE AREA

LOCUSTVILLE POND DAM





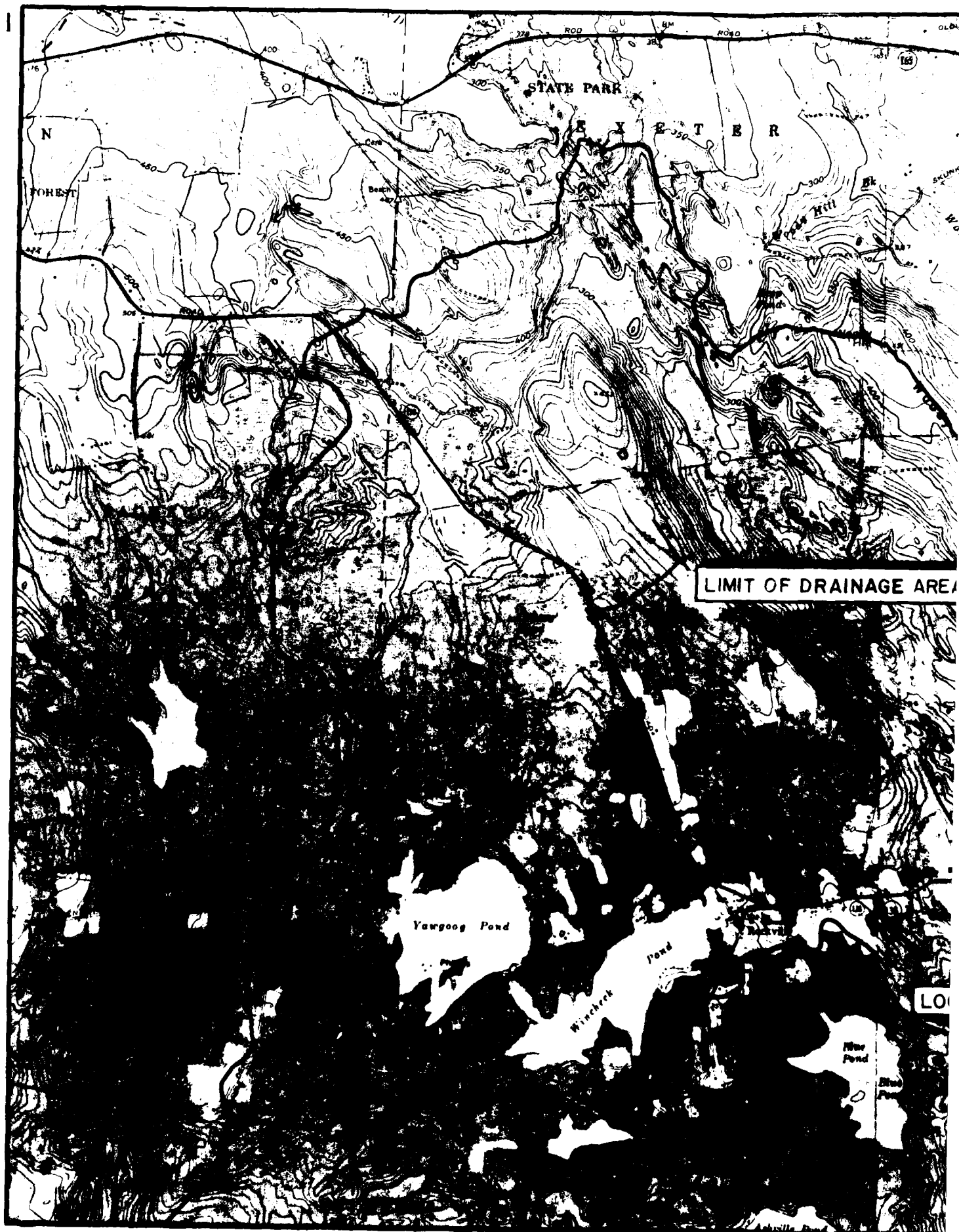






PHOTO C-13: Left spillway from its right abutment. Note the crest settlement at the abutment and cracks in the spillway crest.



PHOTO C-14: Left spillway downstream channel from the left abutment.

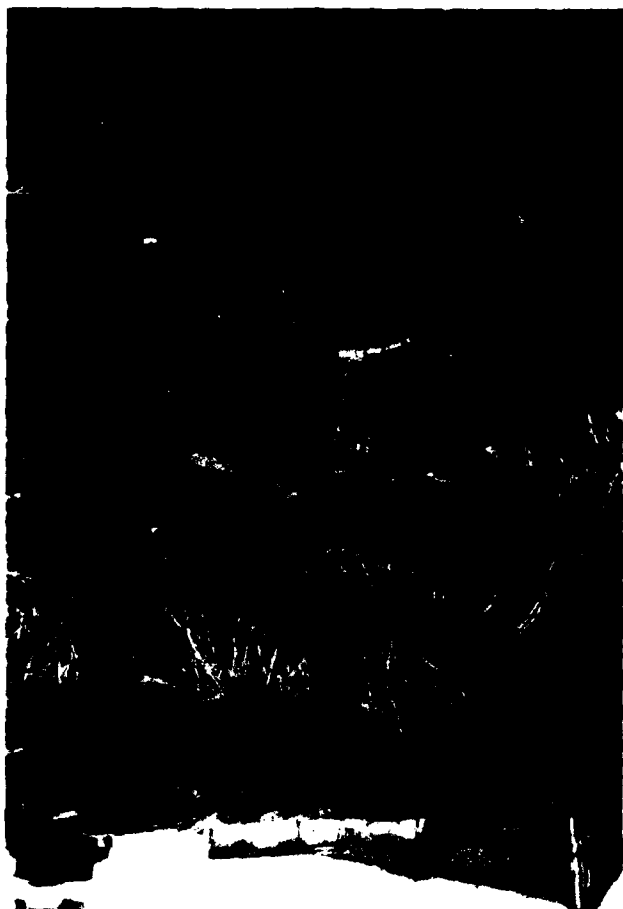


PHOTO C-11: Seepage from the toe of the right headrace wall.



PHOTO C-12: Headrace outlet structure from the right headrace wall. Note poor condition of the stop log structure.



PHOTO C-9: Intake structure and gate for headrace from the left abutment.



PHOTO C-10: Headrace and intake structure at the left abutment. Note mortar missing from the right headrace wall.



PHOTO C-7: Seepage at the toe of downstream face at station 1 + 55.



PHOTO C-8: Irregular downstream face of the dam from station 1 + 50 towards the left spillway.

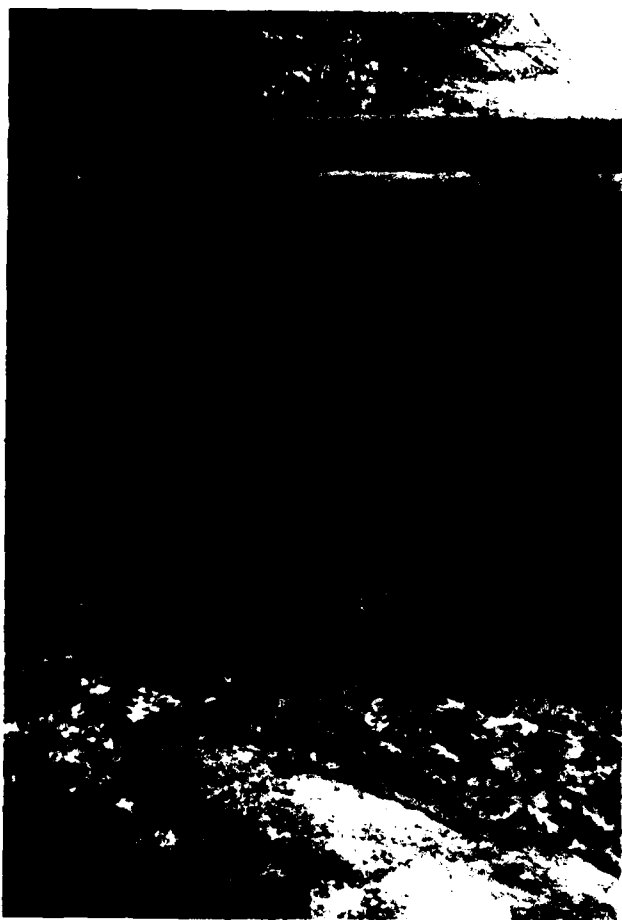


PHOTO C-5: Seepage from the right portion of the downstream face of the right spillway.

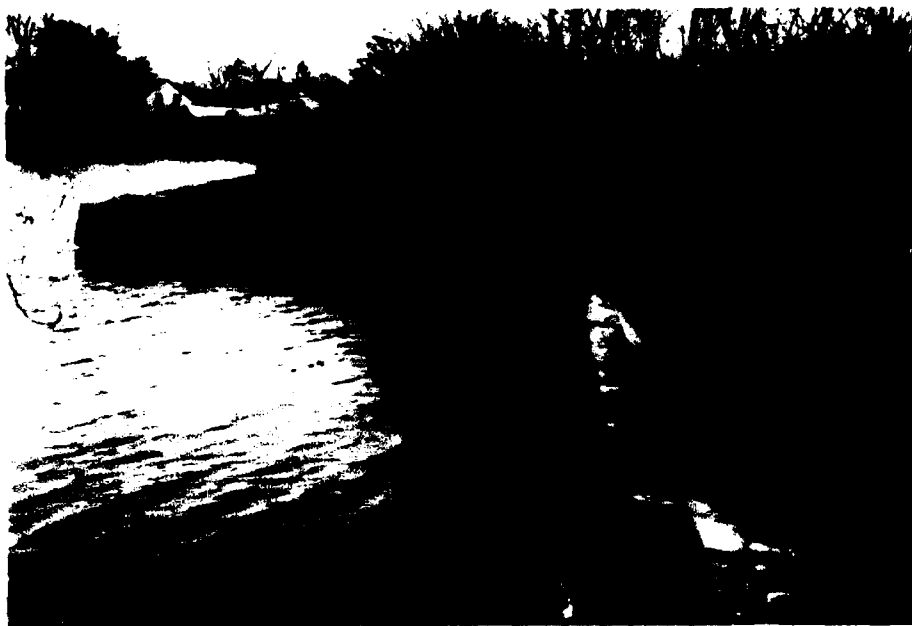


PHOTO C-6: Right spillway from the right abutment. Note deterioration of the left training wall.



PHOTO C-3: Left abutment and entrance to headrace intake structure. Note deterioration of the concrete facing.



PHOTO C-4: Right abutment and downstream face of right spillway from downstream channel.

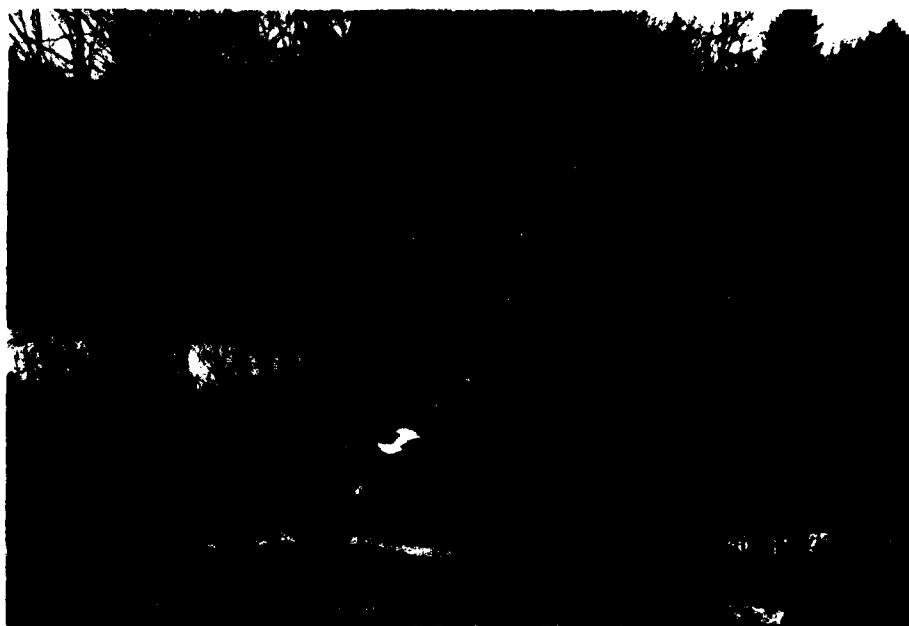
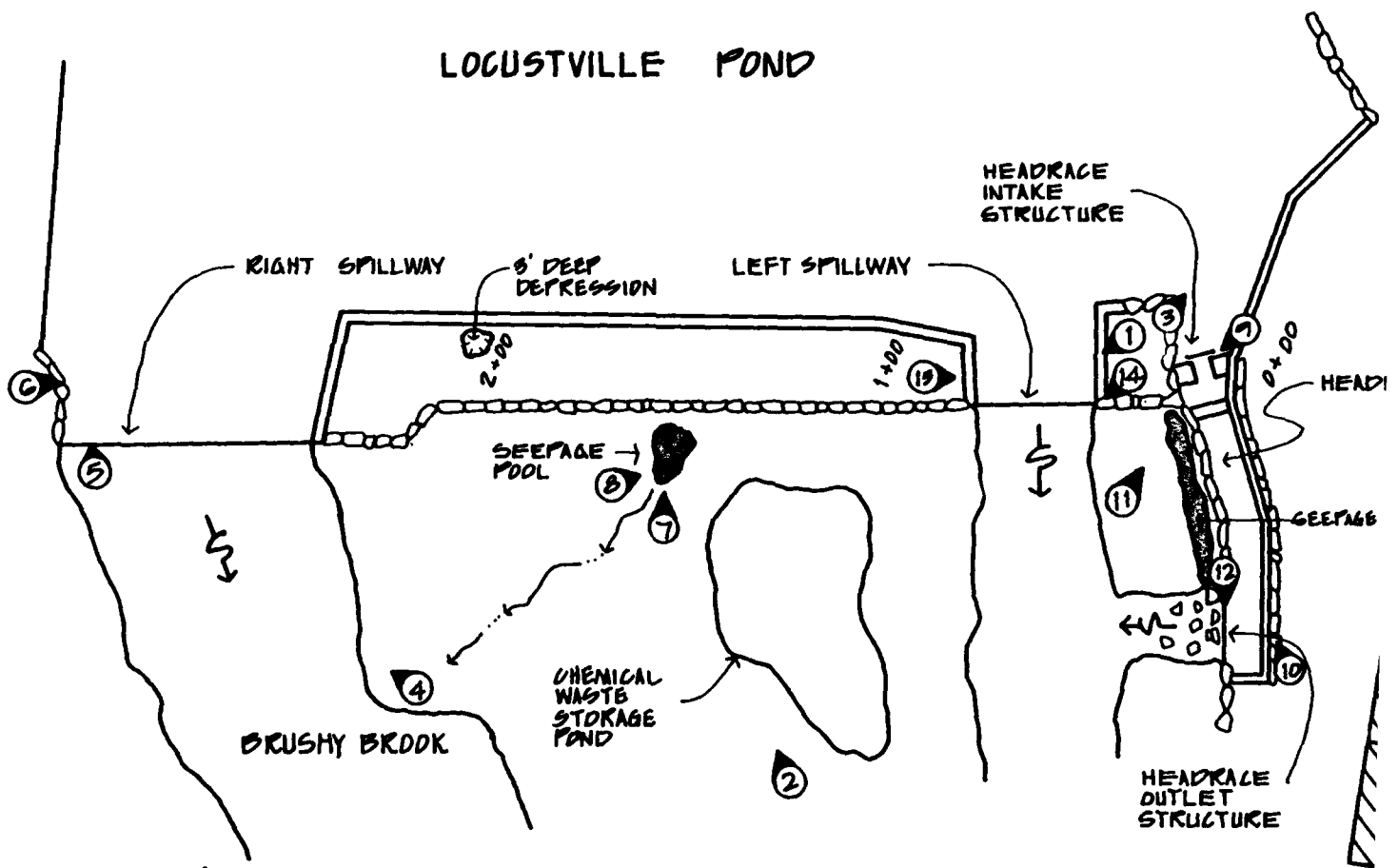


PHOTO C-1: Upstream face of the dam from the left side. Note deterioration of the concrete facing and tree growth on crest.



PHOTO C-2: Downstream face of the dam from the centerline.

# LOCUSTVILLE POND

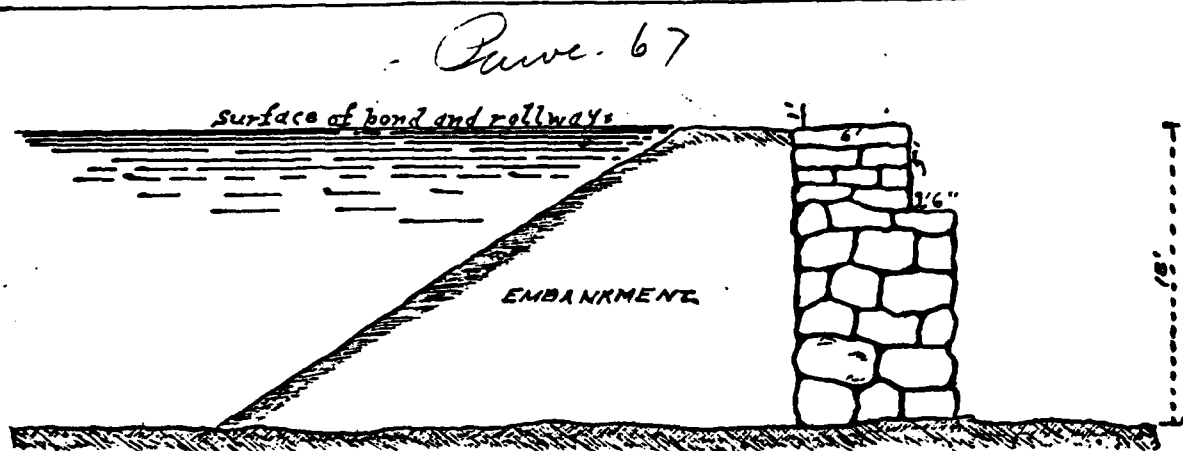


OVERVIEW

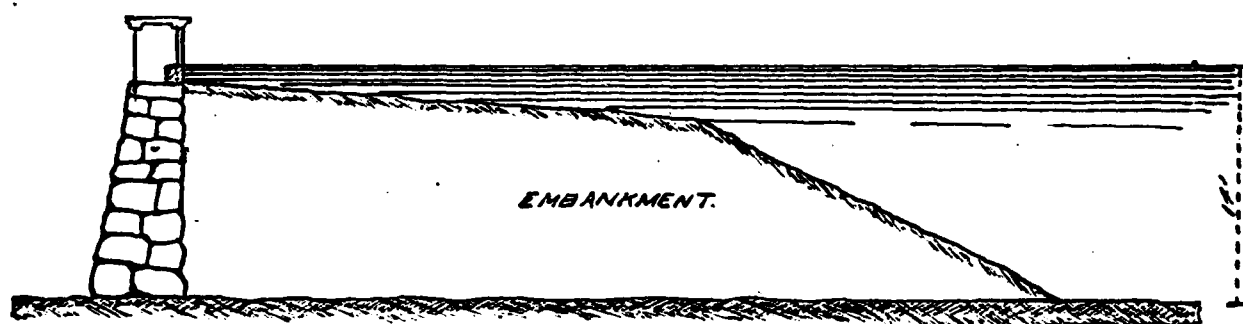
LOCUSTVILLE POND DAM  
PHOTO INDEX. NO SCALE



APPENDIX C  
PHOTOGRAPHS



TRANSVERSE SECTION IN EAST ROLLWAY



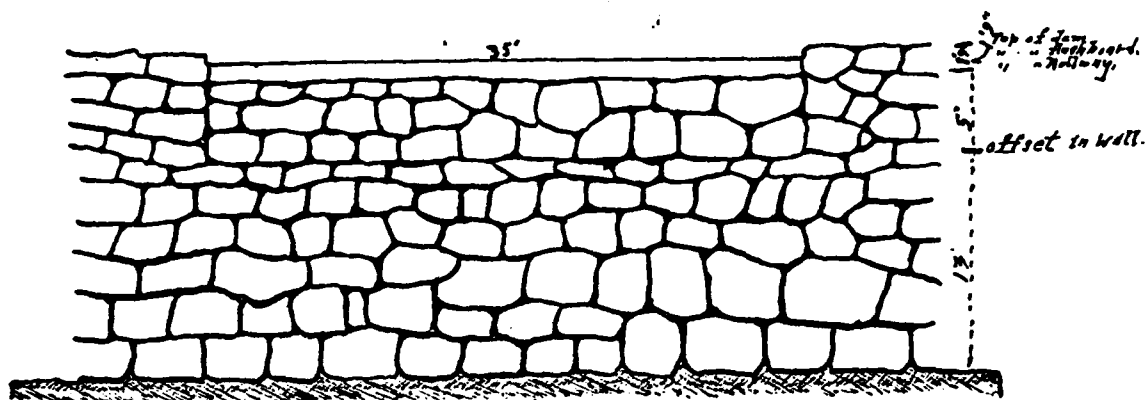
TRANSVERSE SECTION IN WEST ROLLWAY  
OF DAM AT  
LOCUSTVILLE.

Scale 10' = 1"

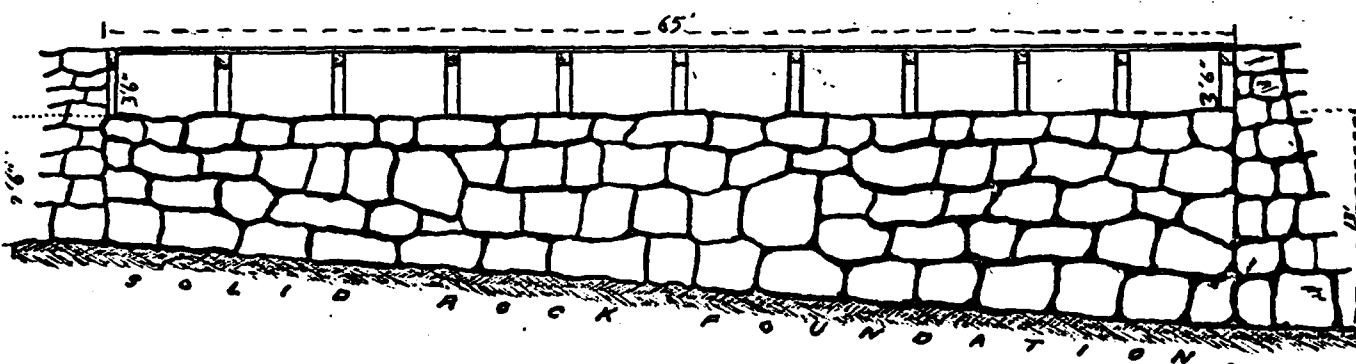
E-1-23

DAM #26

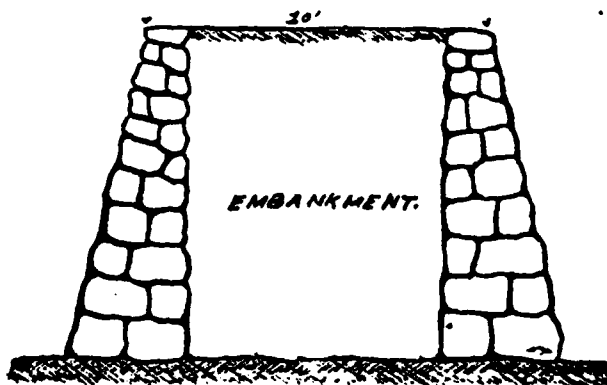
Page 167



ELEVATION OF EAST ROLLWAY



ELEVATION OF WEST ROLLWAY.



TRANSVERSE SECTION  
IN DAM AT  
LOCUSTVILLE.

Dam #262

Scale 10'-1"

FROM ANNUAL REPORT E-1-24

E  
1-2





LOCUSTVILLE POND DAM  
DAM FAILURE IMPACT AREA

Datum: NGVD  
USGS Quadrangle Sheet  
Hope Valley, RI  
Scale: 1:24,000

Plate D-1A

LIMIT OF DRAINAGE BASIN

LOCUSTVILLE POND DAM

LIMIT OF IMPACT AREA

Job No. 80107Project LOCUSTVILLE POND DAMSubject HYDRAULIC/HYDROLOGIC CALC.Sheet 1 of 10Date 1/27/80By DS Ch'k. by LOCUSTVILLE POND DAMBASIC DATA

DRAINAGE AREA = 11.3 SQ. MI.  
NORMAL POOL ELEV. = 95.0 NGVD  
MAX POOL ELEV. = 98.1

RESERVOIR

@ NORMAL POOL - AREA = 90. ACRES  
STORAGE = 630 AC-FT  
@ MAX POOL - AREA = 90 ACRES  
STORAGE = 910 AC-FT

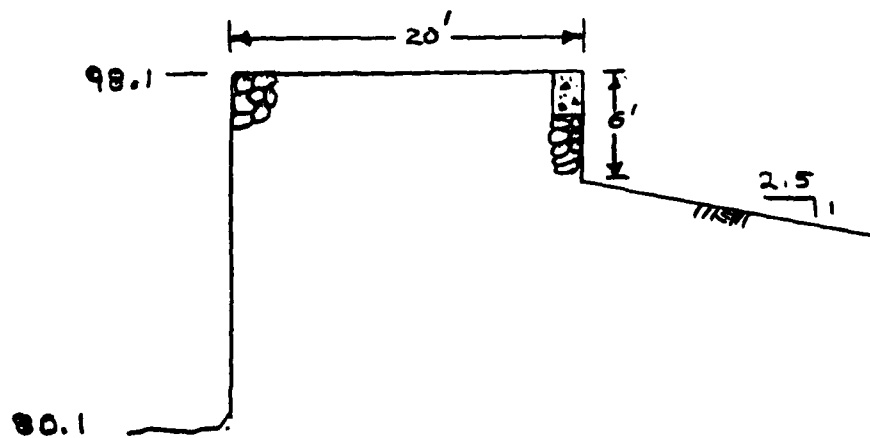
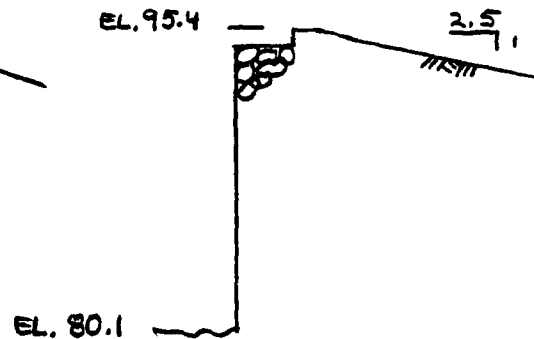
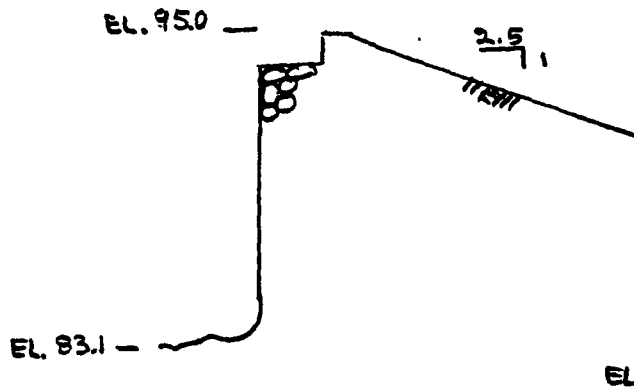
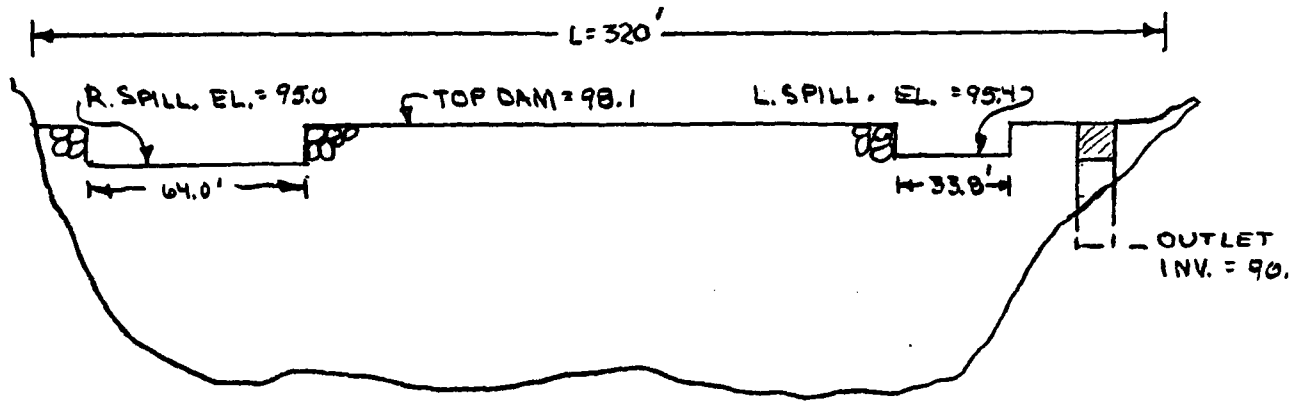
DAM : EARTHFILL W/STONE MASONRY D.S. FACE  
MAX HEIGHT = 18 FT  
LENGTH = 320 FT

SPILLWAYS :

LEFT - STONE MASONRY W/CONCRETE CAP  
CREST = 95.4 NGVD  
LENGTH = 33.8 FT.  
RIGHT - STONE MASONRY W/CONCRETE CAP  
CREST = 95.0 NGVD  
LENGTH = 64.0 FT.

OUTLET : 2.5' W X 5.0' H RECTANGULAR OUTLET W/WOOD GATE  
INVERT = 90.1 NGVD  
OUTLET CONTROLS TO ABANDONED HEADRACE ;  
A SIDE CHANNEL SPILLWAY CONTROLS FLOW  
FROM THE HEADRACE

Job No. 80107 Sheet 3 of 10  
 Project LOCUSTVILLE POND DAM Date 1/27/80  
 Subject \_\_\_\_\_ By DE Ch'k. by \_\_\_\_\_



Job No. LOCUSTVILLE POND DAM 80105 Sheet 3 of 10  
 Project \_\_\_\_\_ Date \_\_\_\_\_  
 Subject \_\_\_\_\_ By \_\_\_\_\_ Ch'k. by \_\_\_\_\_

CALCULATE TEST FLOOD

CLASSIFICATION : SMALL

HAZZARD : HIGH

∴ USE FULL PMF

FLAT < BASIN SLOPE < ROLLING

FOR D.A. = 11.3 SQ MI. , PMF = 1500

REDUCE BY 20% FOR STORAGE AREAS

$$\begin{aligned} \text{PMF} &= .8 \times 1500 = 1200 \text{ CSM} \\ &= 13560 \end{aligned}$$

CALCULATE DAM RATING CURVEDAM & SPILLWAY DISCHARGE =  $CLH^{3/2}$ 

SPILLWAY(2) C = 3.0 DAM C = 2.6 R.SPILL. L = 64.0' ; L.SPILL = 33.8' DAM = 222'

OUTLET DISCHARGE =  $CA\sqrt{2gH}$ 

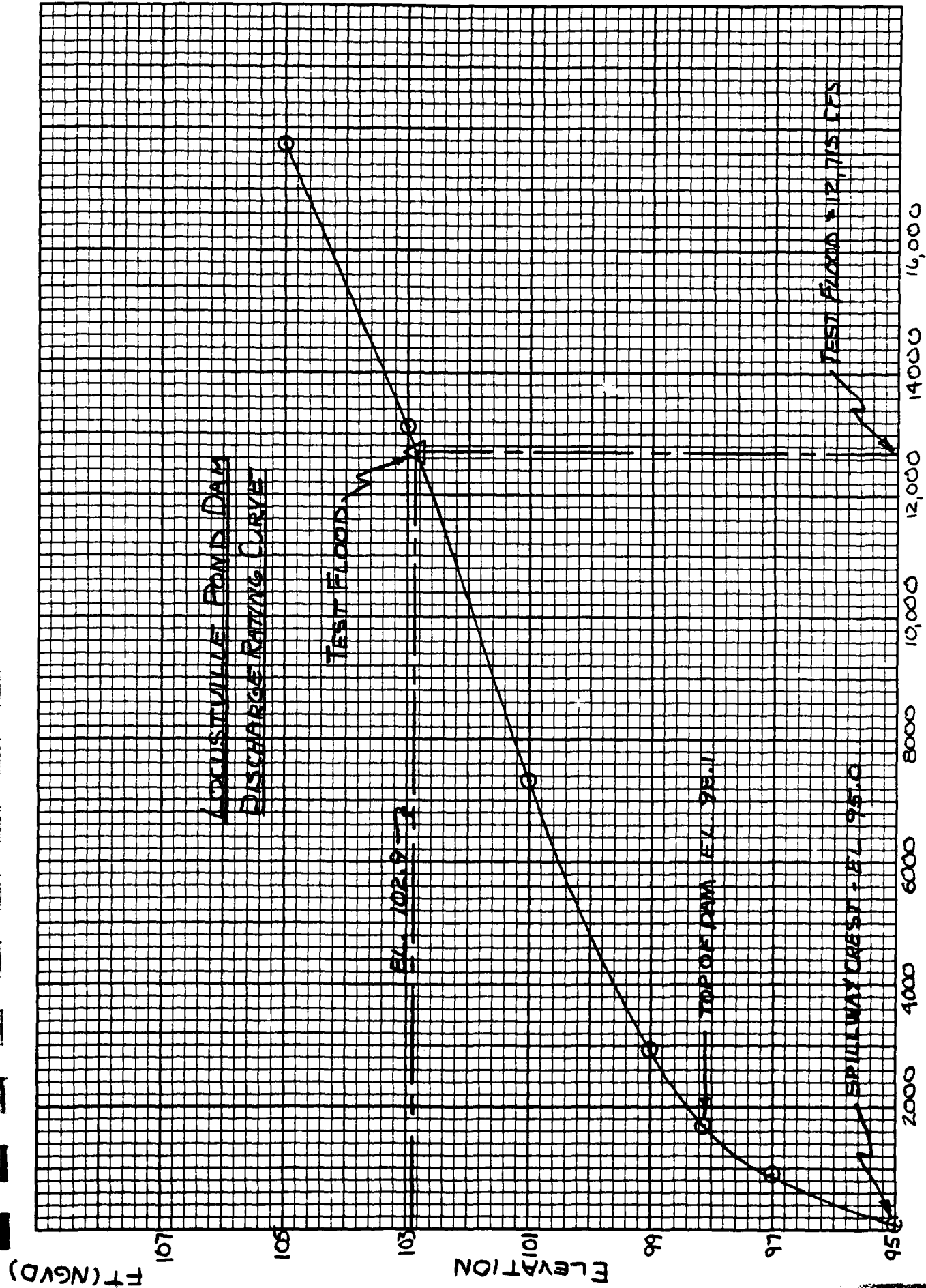
OUTLET C = 0.6 AREA = 5.0 X 2.5 = 12.5 SQ FT. , INVERT = 90.1

ELEV.	R. SPILL H	Q	L. SPILL, H	Q	OUT. H	Q	DAM H	Q	Σ Q
95.0	-	-	-	-	2.9	95	-	-	95
97.0	2.0	543	1.6	205	4.4	125	-	-	873
98.1	3.1	1047	2.7	450	5.5	140	-	-	1637
99.0	4.0	1536	3.6	693	6.4	150	1.0	577	2958
101.0	6.0	2822	5.6	1344	8.4	175	3.0	3000	7340
103.0	8.0	4345	7.6	2125	10.4	195	5.0	6453	12120
105.0	10.0	6071	9.6	3016	12.4	205	6.0	8483	17775

@ TOP OF DAM :

RIGHT SPILLWAY CAP = 1050 CFS  
 LEFT SPILLWAY CAP = 450 CFS } 1500 CFS  
 OUTLET CAP. = 140 CFS  
 TOTAL 1640 CFS





Job No. 8105 Sheet 5 of 10  
 Project LOCUSTVILLE POND DAM Date 1/27/89  
 Subject \_\_\_\_\_ By DS Ch'k. by

CALCULATE EFFECT OF SURCHARGE STORAGE

PEAK INFLOW = 13560, SURCHARGE = 8.1 FT  
 VOLUME = 90 AC X 8.1 = 729 AC-FT

$$V_1 = \frac{729 \times 12 \text{ IN.}}{11.3 \times 640} = 1.21 \text{ IN.}$$

$$Q_{P1} = \left(1 - \frac{1.21}{19}\right) 13560 = 12,700 \text{ CFS}$$

$$\text{@ } 12,700 \text{ CFS, STAGE} = 7.8 \text{ FT} \quad V_2 = \frac{7.8 \times 90 \times 12}{11.3 \times 640} = 1.16$$

$$V_{\text{AVG}} = \frac{1.21 + 1.16}{2} = 1.19$$

$$Q_{P2} = \left(1 - \frac{1.19}{19}\right) 13560 = \underline{\underline{12,715 \text{ CFS}}}$$

1. STORAGE WILL REDUCE TEST FLOOD DISCHARGE BY 845 CFS OR 6%
2. THE SPILLWAYS CAN PASS 1500 CFS OR 11.5% OF THE TEST FLOOD
3. AT THE TEST FLOOD DISCHARGE OF 12,715 CFS, THE DAM WILL BE OVERTOPPED BY 4.8 FT

DAM FAILURE ANALYSIS

$$\text{DAM FAILURE DISCHARGE} = 8/27 W_B \sqrt{g} Y_0^{3/2}$$

$$Y_0 = 18 \text{ FT}$$

$$W_B = 20\% \text{ OF DAM LENGTH @ MID HEIGHT} = .2 \times 300 = 60 \text{ FT}$$

$$Q_{\text{FAIL}} = 8/27 (60) \sqrt{32.2} 18^{3/2}$$

$$= 7700$$

$$+ \underline{1640 \text{ (DAM DISCHARGE)}}$$

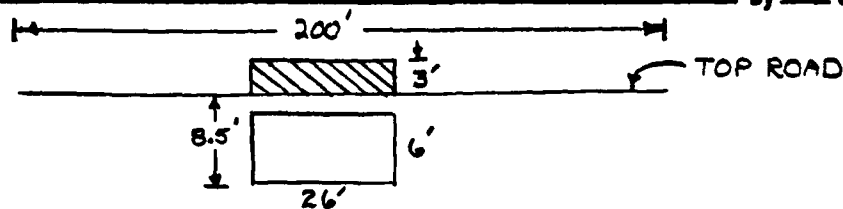
$$\text{TOTAL FAIL. Q} = 8340 \text{ CFS}$$

ESTIMATE DOWNSTREAM IMPACT

REACH 1 - DAM TO ROUTE 3, L = 350 FT.

REACH 1 IS CONTROLLED BY THE BRIDGE @ RT. 3

Job No. 80105 Sheet 6 of 10  
 Project LOCUSTVILLE POND DAM Date 1/27/80  
 Subject \_\_\_\_\_ By DS Ch'k. by \_\_\_\_\_

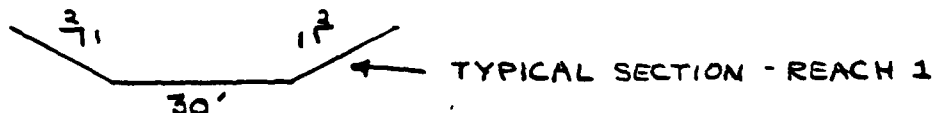


RTE 3 BRIDGE

ESTABLISH DISCHARGE RATING

TOP ROAD DISCHARGE =  $CLH^{3/2}$   $C = 2.6$   $L = 200 - 26 = 174'$   
 BRIDGE DISCHARGE =  $CA\sqrt{2gh}$   $C = 0.55$   $A = 26 \times 6 = 156 \text{ SQ FT}$

STAGE	$H_{top}$	$Q_{top}$	$H_{br}$	$Q_{br}$	$\Sigma Q$
6	3	1193	-	-	1193
8.5	5.5	1615	-	-	1615
10.0	7.0	1822	1.5	831	2653
11.5	8.5	2007	3.0	2350	4357
13.0	10.0	2177	4.5	4964	7140
14.0	11.0	2283	5.5	6707	8990

ESTIMATE OUTFLOW FROM REACH 1

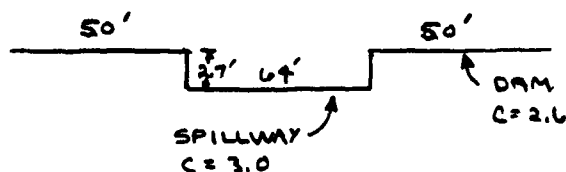
① STAGE = 13.5 FT (FAILURE)  $A = 770 \text{ SQ FT}$   
 ② STAGE = 8.5 FT (PREFAIL.)  $A = 400 \text{ SQ FT}$   
 STOR =  $\frac{370 \times 350}{43560} = 3.0 \text{ AC-FT}$   $370 \text{ SQ FT}$

$Q_{P2} = (1 - \frac{3.0}{9.0}) 8340 = 8312 \text{ CFS}$  @ 8312, STAGE = 13.5'

∴ NO FURTHER ITERATIONS ARE NECESSARY

REACH 2 - RTE 3 → WOOD RIVER DAM

REACH 2 IS CONTROLLED BY WOOD RIVER DAM - REACH LENGTH = 1700 FT.



STAGE	$H_{spill}$	$Q$	$H_{dam}$	$Q$	$\Sigma Q$
1	1	199	-	-	199
2.7	2.7	850	-	-	850
4	4	1535	1.3	385	1920
6	6	2820	3.3	1560	4380
8	8	4345	5.3	3175	7520
9	9	5185	6.3	4110	9295

Job No. 80107Project LOCUSTVILLE POND DAM

Subject \_\_\_\_\_

Sheet 7 of 10Date 11/27/81By DS Ch'k. by \_\_\_\_\_ESTIMATE OUTFLOW FROM REACH 2

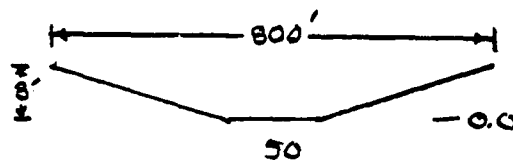
$$\textcircled{1} Q = 8300 \text{ STAGE} = 8.4 \text{ FT}$$

$$\textcircled{2} Q = 1040 \text{ STAGE} = 3.6 \text{ FT}$$

$$\text{AREA} = 3730 - 750$$

$$\text{STOR.} = \frac{2980 \times 1700}{43560}$$

$$= 116 \text{ AC-FT}$$



TYPICAL SECTION - REACH 2

$$Q_{P1} = \left(1 - \frac{116}{910}\right) 8310 = 7250 \text{ CFS}$$

$$\textcircled{2} 7250, \text{ STAGE} = 7.8 \text{ FT}, \text{ AREA} = 3100 - 750 = 2350$$

$$\text{STOR.} = \frac{2350 \times 1700}{43560} = 92 \text{ AC-FT}$$

$$\text{STOR. AVG.} = \frac{92 + 116}{2} = 104$$

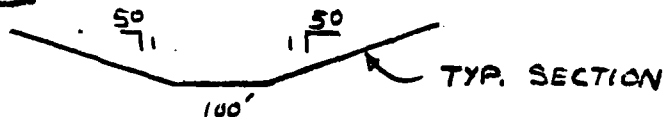
$$Q_{P2} = \left(1 - \frac{104}{910}\right) 8310 = 7360 \text{ CFS}, \text{ STAGE} = \underline{\underline{7.9 \text{ FT}}}$$

∴ DAM WOULD BE OVERTOPPED BY ABOUT 5 FEET

STAGE D.S. OF DAM

$$n = 0.05$$

$$S_f = .002$$



$$\textcircled{2} Q = 7360 \text{ CFS} \text{ STAGE} = \underline{\underline{6 \text{ FT}}} \text{ (BY ITERATION)}$$

DOWNSTREAM IMPACTREACH 1

$$\textcircled{1} \text{ PREFAILURE } Q, \text{ STAGE} = 8.5 \text{ FT (AT BRIDGE)}$$

$$\textcircled{2} \text{ FAILURE } Q, \text{ STAGE} = \underline{\underline{13.5 \text{ FT}}} \text{ (AT BRIDGE)}$$

5.0 FT INCREASE IN STAGE

③ 13.6 FT STAGE, 7-8 RESIDENTIAL, COMMERCIAL STRUCTURES INUNDAED BY 6-8 FT; RT 3 BRIDGE OVERTOPPED BY 5 FT.

REACH 2

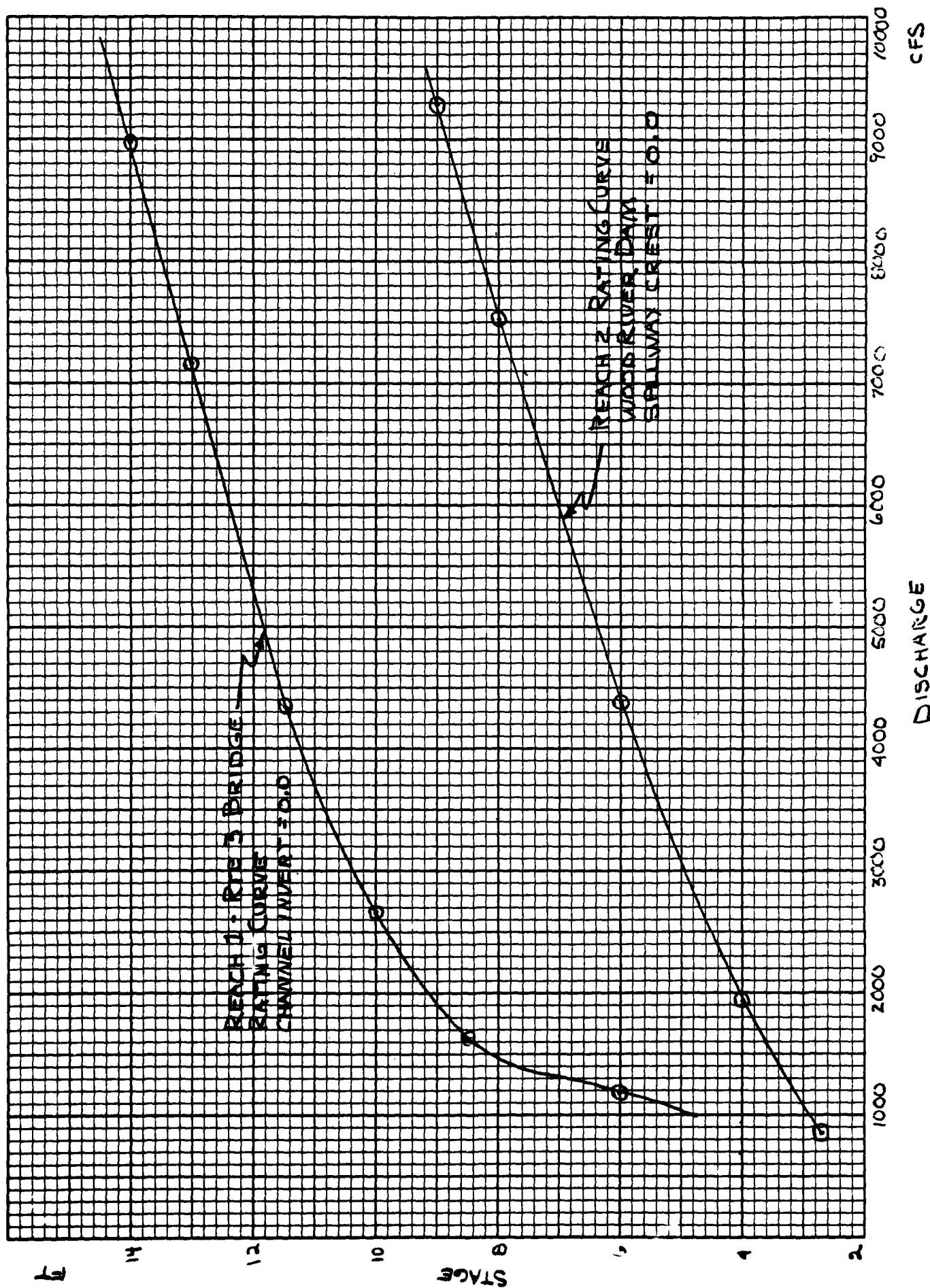
$$\textcircled{1} \text{ PREFAILURE } Q, \text{ STAGE} = 4-8 \text{ FT (IN REACH)}$$

$$\textcircled{2} \text{ FAILURE } Q, \text{ STAGE} = \underline{\underline{8-13 \text{ FT}}} \text{ (IN REACH)}$$

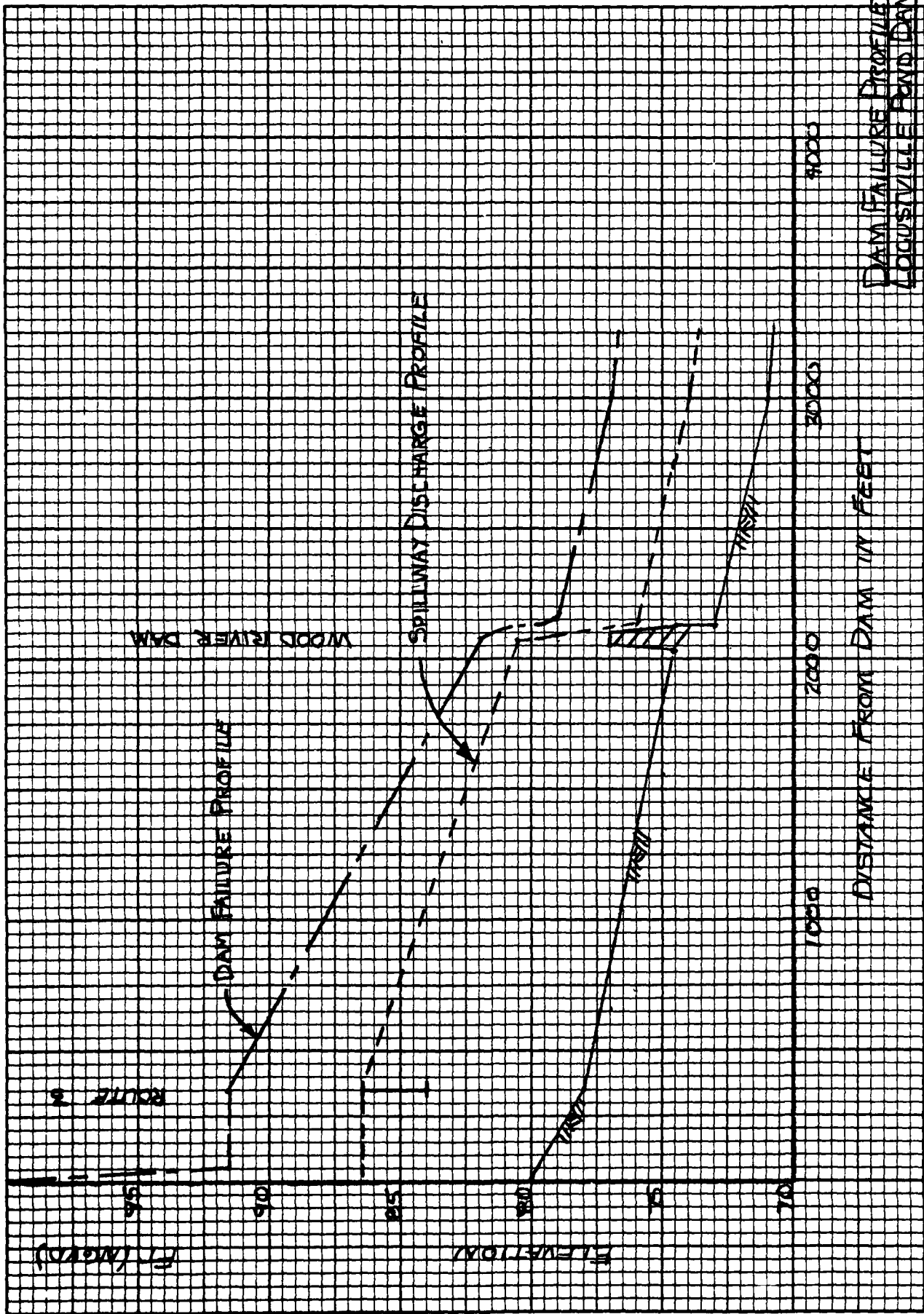
3-5 FT INCREASE IN STAGE

WOOD RIVER DAM WOULD BE OVERTOPPED BY 5 FT AND STRUCTURES (2-3) IMMEDIATELY ADJACENT AND DOWNSTREAM OF THE DAM WOULD BE SUBJECT TO 4-5 FT OF FLOODING.

8/10

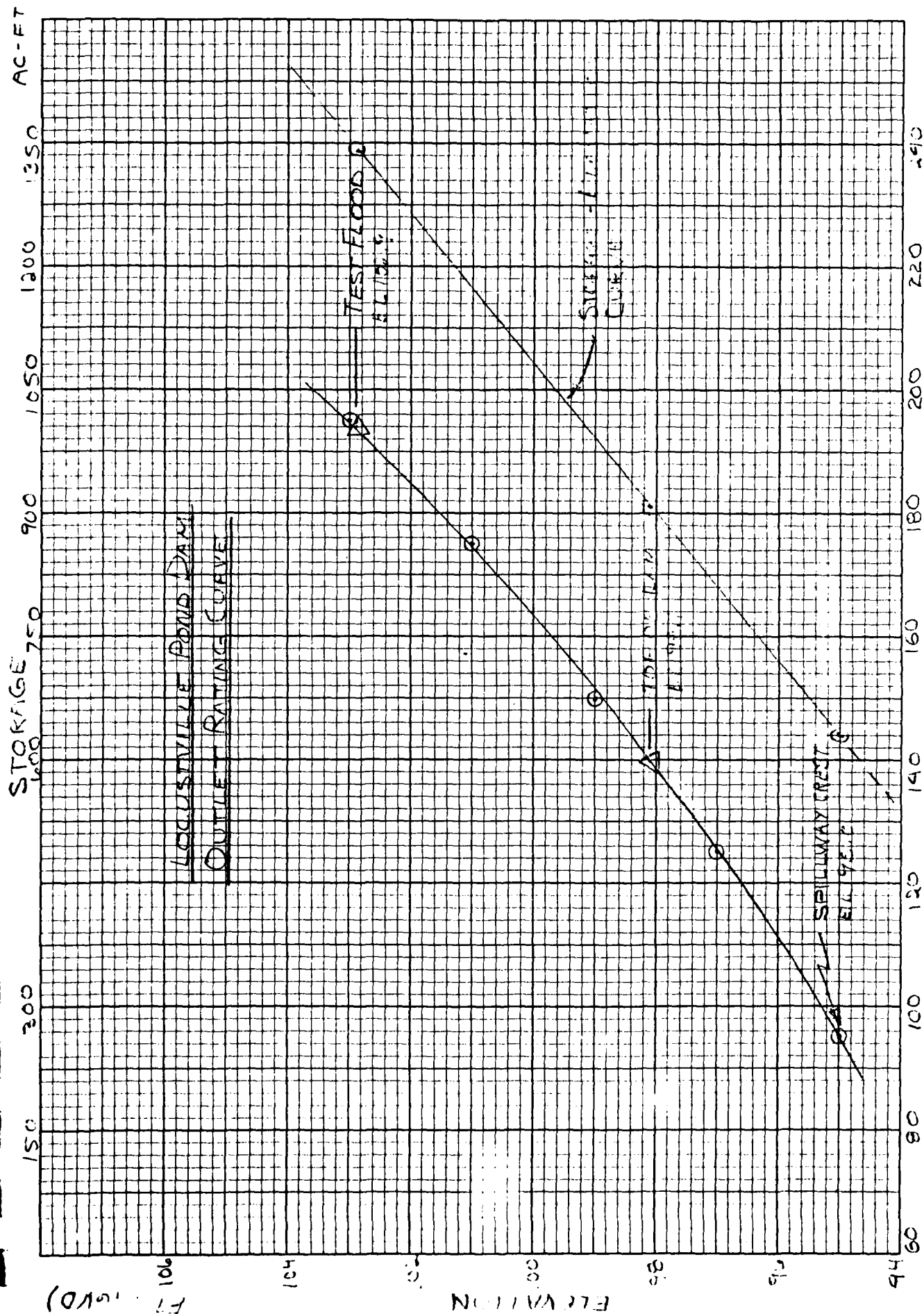


9/10



CFS

DISCHARGE



APPENDIX E

INFORMATION AS CONTAINED IN THE NATIONAL  
INVENTORY OF DAMS



NOT AVAILABLE AT THIS TIME

ATE  
LMED  
-8